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COMMITTEE ON EDUCATIONAL RESEARCH

The University of Alberta

FORTHCOMING ISSUE

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SPECIAL ISSUE

PIAGET: REPLICATIONS AND CRITIQUES

Several manuscripts are in hand but scholars interested in this area are invited to submit manuscripts or give notice of intention to do so.

Editorial Comment

PUBLICATION PROCEDURES

Since December 1965, when the editing and publication of this Journal became an integral part and responsibility of the Division of Educational Research Services many suggestions relating to publication procedures have been received. Educational systems and institutions have frequently and regularly suggested that the publication year be made to coincide with the northern hemisphere academic year.

This suggestion has considerable merit for both contributors and publishers. Many school systems enter subscriptions specifically for selected members of their professional staff such as school principals, superintendents and subject supervisors and co-ordinators. As personnel appointments and resignations are usually effective from the beginning of an academic year it is advantageous for subscription periods to coincide. The work of the editor and his staff would also be simplified.

Several ways of making the change have been considered but all involve serious problems with respect to publication and, particularly accounting. The most feasible scheme so far suggested involves including only two issues in Volume XIII, (March 1967, June 1967) and commencing Volume XIV, with the September 1967 issue. If this is adopted the months of publication will be changed from the current March, June, September and December sequence to an October, January, April and July sequence, which is used by many quarterly professional publications. This change will make issues coincide with the usual academic quarters and, also facilitate publication by establishing better distribution of work in the printing department.

At the time of going to press no decision relating to a change had been made and therefore it is not possible to indicate how subscription payments can be adjusted. Consequently it can only be said that, of course, subscribers will not be financially disadvantaged. At this stage the reaction of subscribers to the proposed change would be helpful and this editorial may be taken as an invitation.

Professor Jones participated in the symposium on models and theories which was published in the September, 1966 issue of this Journal.

Owing to his absence in Europe during last summer a revised draft of his response paper was not available for that issue. It is printed here to complete the discussion and for maximum relevance should be read in direct relation to the other contributions. Professor Jones' response is more complementary to Professor Belth's paper and hence, perhaps, a more significant contribution than those of the other respondents.

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Model Construction: Liberal Arts Revisited

It may be that the "sociologist's response" will be something other than what is expected. It would be quite within the bounds of acceptable sociological inquiry to discuss models *qua* models. After all, it has become rather commonplace for sociologists to concern themselves with models, paradigms, and other problems frequently discussed in the context of theory construction. The nature of definition, the definition of concept, and concepts of law, theory, explanation, and so forth are the frequent concerns of theoretically sophisticated sociologists.

But let me grant this and also acknowledge the fairly extensive discussion of models in "Models, Theories and Education."¹ Presumably, anyone interested in this important topics will have taken the trouble to have read the special issue of *The Alberta Journal of Educational Research*, including Professor Belth's keynote paper. And, hopefully, those not already familiar with Professor Belth's *Education as a Discipline*² will have referred to it. For those not already familiar with the literature, it is quite easy to get a start with the MacIver and Holdaway article.³

Thus, I do not choose to react to Professor Belth's contribution regarding the nature and types of models. Instead, I would rather emphasize what very well may constitute a greater contribution. First, however, I would like to attempt to legitimate my reactions as those of a sociologist.

Sociologists must be interested in society. Deny this and you deny sociology. Of course sociologists may differ with respect to their specific interest in society. It is probably true, however, that the majority of sociologists focus in one way or another on the many and varied ways in which society, that is, social relations, determines human behaviour. It is also possible for a sociologist to be concerned with society in the sense that he searches for some idea of what form of society (social relations) is desirable. This type of concern about society is sometimes deemed inadmissible to the house of modern scientific sociology. But this may be more a function of North American sociology than sociology proper.

It is precisely in the context of an idea of a desirable kind of society that I want to react to Professor Belth's work. As it turns out, I believe that Belth is really talking about exactly that kind of education that is necessary to the kind of society that I think is desirable. If the reader will grant such an evaluative and normative type sociology, then let us make the most of it.

Types Of Society

It is possible to draw in broad outline the various types of society. For this purpose I would suggest there is no better source than the remarkable works of Pitirim A. Sorokin. He has provided in great detail the basic alternatives with respect to society, or as he refers to them, types of systems of interaction processes and social relationships—the social aspect of the superorganic. Sorokin discusses in detail the basic forms of interaction in terms of (1) organized, unorganized, and disorganized, (2) solidary, antagonistic, and mixed, and (3) integrated, unintegrated, and contradictory types.

With special focus on society as organized, solidary, and integrated, Sorokin writes the following:

Any theory claiming that solidarity is always based only upon similarity or only upon dissimilarity, without further specification and reservations, is void. Likewise all theories that ascribe antagonism either to similarity or dissimilarity are untenable. As a rule solidary as well as antagonistic relationships are generated by a combination of sociocultural similarities and dissimilarities This means that a solidary society can be created not only out of 'one race, one nation, one government' with subsidiary differences of its subgroups, but also out of many diverse racial, ethnic, political, and religious groups when they have a common fund of main values and concordant norms side by side with their specific values and traits. Historically social 'unity in diversity' has been as common as the mono-ethnic, mono-racial, mono-religious, and other 'monolithic societies.' This also means that the problems of various minorities can be solved not only in the way of 'amalgamation and

assimilation, that is through melting and elimination of their diverse traits and values into the traits and values of the majority, but also through a stimulation and development of the specific traits and values of the minorities side by side with a development of the common fund of values for the majority and minority. If they have and practice the value-norm of mutual respect of their differences such a common concordant value-norm provides the minimum of the common fund necessary for a solidary coexistence of different persons and groups.

No study of similar and dissimilar traits taken overtly, atomistically, without reference to the value systems of the interacting persons or groups, can yield valid results or real uniformities, in the relationships of these traits to the solidarity or antagonism of the parties. This equally concerns marital union, as well as occupational, economic, religious, ethnic, racial, political, and other social groups.⁴

This quotation points out one of the most important characteristics of the type of society that has been regarded as desirable by many theorists through the ages. It is a simple matter to find repetitions of this theme of *unity amidst diversity* in the literature. Perhaps the oldest expression of this idea is found in the notions of Yin and Yang. Somewhat later it appears as the ancient metaphysical problem of the One and the Many. You will recall especially Plato's *Parmenides*. The concept appears in the work of Nicholas of Cusa (15th Century) and Giambattista Vico (17th Century). The concept is important in the work of Cassirer, Whitehead, von Bertalanffy, and so forth. Indeed, it can be shown that nearly every civilization has had its "myth of polarity."⁵ An application of the idea forms the basis for Emery Reve's *Anatomy of Peace*.⁶

These few references out of many suggest the same idea over and over again: the *sine qua non* of man's knowledge, happiness, and existence is to be found in the reconciliation of opposites—the unity of opposites. In the context of society, it matters little what the size of the society is. It makes little difference whether the society is a marriage, a small group, a large industrial organization, a community, a nation, or many nations—the basic issue is that of the reconciliation of the individual with the group, the organization, or the reconciliation of personal freedom with public power.

What all of this adds up to for this paper is the idea that social organization must account for at the same time the possibility of personal freedom and political order—the achievement of oneness *and* manyness, unity *amidst* diversity, sameness *and* difference. All of this is the Sorokin quotation. And as one final example of this idea, then, let me quote Lancelot Law Whyte from a great editorial in the *Saturday Review*:

Many of the world's greatest thinkers have interpreted this century as a period of transition—but to what? I suggest that the present unstable period of mental and social metamorphosis will lead to a greater stability supported by a unification of the sciences on an esthetic foundation—a principle of the union of contrasts, making possible proper control of their applications, and providing insight into the most urgent needs of mankind.

But this prophecy is subject to a grave question: Will the present regional attitudes of pathological intensity be sufficiently restrained by the universal awareness—which I believe is now spreading—that, given a chance, Mankind does rejoice in life and the desire to survive? Only when the race is united in its awareness that delight in living is primary and is aware that it is so united will there be reason and will to discard the bombs. If human life is felt to be evil, tragic, or merely absurd, why bother?

Science and love are natural responses of Man. Thus our task is simple: We have to attain an awareness which transcends both and can achieve their coordination.

. . . Here we reach the clue to the new condition, which is more than love plus science. Organic coordination is the union of contrasts, the integration of differentiated parts, harmony in diversity.⁷

Whyte's statement not only reflects the importance of "organic coordination," but you will note that he also emphasizes "awareness" of this. Two ideas emerge. First, it is essential that one has a concept of order (including social order), and second, there must be a universal awareness of the desired type of unity. It is precisely at this point that education enters the picture.

Society and Education

Political unity and social order (and, therefore, personal freedom and happiness) must be based on a union of contrasts—unity amidst diversity. Now if this is the type of society one desires, then it is absolutely necessary to have a certain kind of education. It seems to me that the tragic error in certain modern approaches to education is the idea that we will have a certain kind of society existing side by side with a philosophy of education that refuses to reconstruct its educational practices in a manner that will at least partly achieve our cultural goals. This refusal is often made in the name of some notion of pseudo-democracy—a notion which is actually more akin to anarchy than democracy. Somewhat more concretely, we might say that it is a monstrous perversion of thought that fails to see that the very possibility of Canadian unity (federalism, or whatever term you choose to call it) can be accomplished where an educational system does not exist to teach for it. If an intellect fails to understand, for example, "organic coordination", then there is no reason to believe "organic coordination" will come to exist. This at once reflects the hope and the failure of education.

In this setting, then, let us ask how it is possible to teach for "organic coordination." There are alternatives. We might, for example, attempt to indoctrinate youngsters in terms of a particular concrete manifestation of a general idea *re* political and social order. This approach is something less than unfamiliar in the history of societies and education. But in the long-run this does not seem to work too well—not to mention the ethical implications of such an approach. Concrete manifestations are means. And it is certainly a folly to suppose that as "times change" one means can accomplish a given goal in any time and in any place. Surely it is a

folly to expect, for example, that a town meeting plan will be successful in a complex industrial society.

As I mentioned earlier, it is precisely at this point that Belth makes what I consider to be a highly significant contribution. This contribution far exceeds his technical discussion of models *qua* models. The truly important question asks *what do we expect model constructing to accomplish?* After careful study of Belth's work, I am convinced that he expects education conceived in terms of model building to lead to the kind of awareness, and, therefore, the kind of society I have discussed above. The kind of insight that accrues from education based on model building provides the kind of insight necessary for establishing a desirable society. Belth's ideas do not lead us into the trap of teaching a particular manifestation of an idea, a manifestation that can only become obsolete in time, but instead teaches *for* society, that is, for the kind of insight that makes possible the seeing of the idea of society. The idea can only be understood if certain intellectual conditions are met. When these conditions are not satisfied, then indoctrination becomes the useful alternative.

Model Building: General Education Revisited

Another way of looking at Belth's thesis may be found in looking back at some earlier discussions of what education should be. There is some basis for arguing that the discussions of a few years ago of general education and critical thinking were directed toward the kind of insight and awareness mentioned above. These "movements" somehow did not seem to make the grade. On the other hand, some progress was made—at least in terms of focussing attention on an important function of education. A vast literature grew out of these "movements", and in this literature one can find precursors of Belth's thesis.

Still in a general vein, it is interesting to look at Dewey's famous definition of inquiry: "... the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements into a unified whole."⁸

Reading this definition of inquiry (no problem-solving or critical thinking) one sees that this quotation could just as well refer to social reconstruction, or, if you will, the basis for achieving "organic coordination". If we now juxtaposition the following quotation from Belth, about the same pattern emerges:

The use of metaphor is evidence of concern with the economic integration of ideas and experiences given the form of tokens or ikons, and culled from many sources at many levels. Analogies, which are cases of metaphors, make wholes of segmented experiences, experiences which are treated otherwise as self-contained entities of confrontation and which are accepted as they are immediately received, thus requiring nothing more to sustain their

meanings and their significance. Metaphors are deliberate interweavings of separate skeins of experience which produce new images.

It must be understood that this description is itself metaphoric of either the process of weaving, or of architecture, by which we bring together stones to create an integrated, harmoniously constructed house. But what is clear is that within the metaphor the separate elements brought together find a power and a meaning which they could never have separately. This is the force of the metaphor, of the analogy.⁹

Other equally relevant passages are found throughout *Education as a Discipline*. What is true of Dewey's definition of inquiry is equally true for the emphasis that Belth places on the role of analogy and metaphor.

I suppose no general remarks of the kind being made could be regarded as even partially adequate if they do not mention Jerome Bruner. You will recall that according to Bruner, "grasping the structure of a subject is understanding it in a way that permits many other things to be related to it meaningfully. To learn structure, in short, is to learn how things are related".¹⁰ Now at the risk of becoming pedantic, I point out the obvious when I suggest that the learned structure can be social and political structure.

And finally, though not exhaustive of the literature by any means, we find a restatement of my whole thesis in these remarks: "... a society that can in any genuine sense be called democratic will call upon a very large proportion of our people, not an elite handful, to think and feel as educated men and women think and feel."¹¹ According to Broudy, Smith, and Burnett, the "interpretive" use of schooling is concerned primarily with orientation and perspective. They write that "experience becomes intelligible only as we categorize it, conceptualize it, or classify it. In other words, experience becomes intelligible and intelligently manageable insofar as we impose form upon it."¹² Imposing form is inquiry and understanding. The construction and application of models is the same.

As we pursue the line I have been following we discover interesting bedfellows and a recurrent theme as a result. We find an idea which has been discovered over and over again. We also find educators who have discovered the idea and have repeatedly tried to translate the hope of a particular idea of society and the prerequisites for its realization into educational practice. I must confess that I believe our ability to formulate the appropriate theoretical framework for a desirable society and the commensurate educational means by far exceeds our success in implementation. It remains to be seen whether Belth's important contribution to the theory will have any impact on the practice.

The Classical Liberal Arts

In the brief outline above I have referred mostly to somewhat recent thoughts on education. It seems to me, however, that another way to look at Belth's work is to view it as a restatement of a tradition even

older than any mentioned earlier. Reference is, of course, to the classical liberal arts, especially the *trivium*. This is indeed dangerous. Probably no other tradition has fallen into as great disrepute as this one. I hasten to add, however, that I am convinced that the rejection of this tradition is based on an ignorance of the tradition. Belth does not explicitly embrace this tradition, but as I read him, I believe he falls within it. Let us take a look at this tradition and then return to look at Belth's work.

It will be recalled that the liberal arts were divided into the categories, the *quadrivium* and the *trivium*. As I mentioned earlier, it is the *trivium* that is of interest here. The three arts that constitute the *trivium* are grammar, rhetoric and dialectic. These arts have been characterized as follows:

As long as our analysis is concerned with making explicit a form still incarnate in the individual instance, which constitutes its particular structure, we are at the level of grammatical analysis. But when the spark of persuasion leaps the gap between the two instances as a result of the common grammatical form evoked in the second instance, then we have moved from the level of grammar proper and are on the threshold of rhetoric as a liberal art. . . . If we set up a resemblance between individual instances . . . to reveal their common archetypal form in such a way as to extract the universal proposition implied therein, it is a case of induction; and we are at the level dialectic.¹³

These are no simple arts. They lie at the very foundation of induction, abstraction, and measurement. For example, at the second level of analysis, the rhetorical level, an isomorphic mapping of two domains or systems is achieved. Thus in what is called trivial analysis* we find the very root of modern ideas of measurement. Also as a result of trivial analysis we find the basis for a unification of science that was briefly alluded to in the quotation from Whyte. In this regard we find the genius of Ludwig von Bertalanffy and his focus on the "logical homology" of laws.¹⁴

This is certainly a brief characterization of the classical notion of the *trivium* as liberal arts, but I believe it will serve the purpose. If we remember the importance of isomorphism in knowing (including scientific knowing) it becomes clear why Belth places so much emphasis on analogy and metaphor. Recall, too, that the term "paradigm" is translated as "example"—taken in the Aristotelian sense. Again, some of the connections between the *trivium* and modern ideas about theory construction emerge.

One of the virtues, perhaps, of Belth's work is that he has taken an old idea and refurbished it. He has taken an old *logos* and dressed it in new language. For me, he has done something more than merely trot out an old horse. He has developed a vitally important idea in contemporary language in terms of modern knowledge in theory construction.

*i.e. analysis based on the studies indicated in the *trivium*.

Belth also discusses this idea in terms of the curriculum. Thus, he writes that "we are concerned with curriculum as the manifestation of ways and levels of thinking, as models and methods for dealing with the events each of us confronts in his existence."¹⁵

While Belth does indeed discuss several types of models, it is his discussion of analogue models and analogical thinking that make it especially easy to fit his ideas into the classical tradition. You will recall his four points concerning analogical thinking: first, he tells us that analogies allow us to think about a problem in a way that would not otherwise be possible. Second, analogies refer to the internal relationships of these things. Third, an analogue allows us to organize data in an important way, and fourth, the uses of analogy suggest necessary limits of comparison which can be made between the functional relationships of two events.¹⁶

Out of this discussion Belth concludes that "education would be best described as the activities whose objective it is to nurture a capacity for development and use of analogy and of other models which are necessary in the thinking act."¹⁷

Summary

Looking back, now, I have suggested that Belth's larger view is compatible with the classical notion of the *trivium*, that both, properly understood, provide the groundwork for the most important kind of thinking—the kind that liberated man from ignorance. Further, Belth falls in the tradition of other thinkers that have been concerned with inquiry, critical thinking, etc. Out of all of this comes, I believe, the possibility for a kind of education that at least has a chance of leading to a kind of society that resolves problems of conflict—the conflict of the individual and the organization, the conflict of the state or province in the nation, the conflict of nations in the world. Belth does not embrace the trappings of scholasticism nor does he fall for a simple positivism. On the other hand, his thought does reflect some older notions that desperately need modern restatement. He has done this. I am not at all certain that Professor Belth wants some of these men and ideas as bedfellows, but I know of no better way to compliment a scholar.

REFERENCES

- ¹ See "Models, Theories and Education," A Special Issue, *The Alberta Journal of Educational Research*, Vol. XII, No. 3, (September, 1966).
- ² Marc Belth, *Education as a Discipline*, (Boston: Allyn and Bacon, 1965).
- ³ D. A. MacIver and E. A. Holdaway, "An Analysis of the Use of Models in Education," *The Alberta Journal of Educational Research*, Op. cit., pp. 163-188.
- ⁴ Pitirim A. Sorokin, *Society, Culture, and Personality*, (New York: Cooper Square Publishers, Inc., 1962), p. 144.
- ⁵ Alan W. Watts, *The Two Hands of God: The Myth of Polarity*, (New York: George Braziller, Inc., 1963).

- ⁶ Emery Reves, *The Anatomy of Peace*, (New York: The Viking Press, 1963).
- ⁷ Lancelot Law Whyte, "Man's Task: A Union of Contrasts," *Saturday Review*, November 12, 1966, p. 32.
- ⁸ John Dewey, *Logic: The Theory of Inquiry*, (New York: Henry Holt and Co., 1938), p. 103.
- ⁹ Marc Bleth, "The Study of Models as the Study of Education," *The Alberta Journal of Educational Research*, *Op. Cit.*, pp. 205-206.
- ¹⁰ Jerome S. Bruner, *The Process of Education*, (New York: Vintage Books, 1960), p. 7.
- ¹¹ H. S. Broudy, B. O. Smith and J. R. Burnett, *Democracy and Excellence in American Secondary Education*, (Chicago: Rand McNally and Co.), 1964, p. 45.
- ¹² *Ibid.*, p. 54.
- ¹³ Lewis M. Hammond, "Rhetoric and Dialectic," reprint from a speech given before the Eastern Public Speaking Conference, 1940.
- ¹⁴ See especially his *Problems of Life*, (New York: Harper and Brothers, Torchbook TB 521, 1960). See also several selections in the volumes of the *Yearbook of The Society for General Systems Research*.
- ¹⁵ *Education as a Discipline*, p. 266.
- ¹⁶ "The Study of Education as the Study of Models," p. 214f.
- ¹⁷ *Ibid.*, p. 216.

This article presents the results of research based on comparison between a Rural and a Selected Urban sample of first-grade children. The author examined between group differences in persistence when the subjects were presented with conflict-producing situations and analysed the kinds of responses favoured and relied on. He also gives attention to the degree to which subjects in each group attempt to evaluate their own suggested solutions to 'conflict' situations.

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Factors Related To Persistence In Inquiry*

Introduction

Piaget's so-called "equilibration" position¹ has provided a common conceptual framework for a number of studies, wherein it has been extended to apply, not only in the descriptive-developmental context, but also to experimentation dealing with learning and with the inquiry process. Among the learning studies are those of Smedslund,^{2,3} Palmer,⁴ Gruen,⁵ and Beilin.⁶ All these have been attempts to accelerate children's acquisition of certain of the well-known conservation concepts. Suchman^{7,8} and Palmer^{9,10} have explored some of the implications of this position for the investigation of the inquiry process.

A central thesis in Piaget's conceptual system is that cognitive progress is achieved through a process of adaptation. The child, for instance, on innumerable successive occasions, actively confronts externally given events, and manages to assimilate them to the extent that he is able to accommodate to them. Increased cognitive differentiation and integration are achieved through successive equilibrations between assimilation and accommodation.

*The research reported herein was performed pursuant to a contract with the United States Department of Health, Education, and Welfare, Office of Education, under the provisions of the Cooperative Research Program.

For purposes of experimentation and instruction, a child who is at equilibrium with certain misconceptions may often be presented with information which he cannot reconcile with these misconceptions. When this occurs, he may be said to be in a state of disequilibrium, or cognitive conflict. In the course of resolving this conflict, he may displace his earlier, mistaken conceptions, and acquire new concepts or principles. Not all forms of conflict resolution may be so constructive, however. Individuals not capable of realistically evaluating the adequacy or inadequacy of their attempts to resolve the conflict may often resolve it inadequately, yet feel that they have resolved it adequately, and so achieve a false sense of equilibrium. As a result, they may terminate inquiry prematurely. Presumably, the child who is trained to avoid non-constructive forms of conflict resolution will be less prone to terminate inquiry prematurely. He will not be satisfied with inadequate accounts, and so will continue his attempts to secure additional information which may be of use in resolving the conflict.

Problem

If the cognitive progress of some children is typically impeded due to their recourse to nonconstructive forms of conflict resolution then we need to identify these forms so that, hopefully, we may train children to avoid them. One objective of the present study is to identify non-constructive forms of conflict resolution employed by first-grade children.

A second objective is to compare the forms of conflict resolution employed by two groups of first-grade children that differ in certain social and intellectual background characteristics. It is assumed that the standards of adequacy employed by an individual in evaluating his own attempts to resolve cognitive conflicts are acquired largely through a process of social transmission. For the purposes of the present study, it is assumed that a selected group of urban children will have acquired more rigorous standards than will have been acquired by a group of rural children. Certain hypotheses following from this assumption will be presented and tested in the results section below.

A third objective is to test certain hypotheses relating children's expressions of subjective certainty to their forms of conflict resolution. For this purpose, each explanation and each prediction given by a child will be followed by a measure of the certainty with which he feels his answer to be correct. This measure will be taken as an operational interpretation of the equilibrium-disequilibrium dimension, where high certainty corresponds to high equilibrium.

Methods

Sample

The Selected Urban group consisted of the total first-grade enrolment of a demonstration school located in an urban community. There were

forty-seven Ss in this group, all of whom had attended kindergarten previously. Eighty-two percent of the fathers of these children had completed some schooling beyond the twelfth grade. Forty-seven percent held Doctorates. The average age of the Ss was 6-6. It must be emphasized that this is a selected, and by no means a typical, group of urban children. The purpose of the selectivity was to provide for the clear identification of differences in the forms of conflict resolution employed by this group and by a group of rural school children. The Rural group consisted of the combined first-grade enrolments of two rural schools, serving predominantly lower-class families. There were forty-four Ss in this group. Only eight of the fathers of these Ss had completed the twelfth grade, and only four had any college training. The average age was 6-5.

Procedures

Each *S*, was presented, individually, with two conflict-producing events. The same sequence of presentation was followed with each *S*. Each prediction and each explanation given by an *S* was followed by a question designed to measure the certainty with which he held his answer to be "right". With respect to this measure, the Ss were pre-trained to respond both to a set of verbally-presented response alternatives, and to a corresponding set of graphically-presented response alternatives, in the form of simply-drawn faces. The verbal alternatives and their graphic counterparts were: "I am very sure my answer is right" (smiling face); "My answer may be right, but I am not so sure" (slightly smiling face); "My answer is probably wrong" (slightly unhappy face).

The first conflict-producing event (the Floating task) was presented as follows:

Two identical bowls were presented, one containing salt water, and the other an equal amount of plain water. The Ss were not informed of any differences between the media, and none was apparent. Two egg-shaped objects made of a silicone substance which floats in salt water but sinks in plain water were used. One contained about twice as much substance as the other. The Ss were asked to pretend that these objects were eggs. The large object was dropped into the plain water, and the small one into the salt water. It was pointed out to the Ss that one sank, or "went down," while the other floated, or "stayed up." The Ss were asked, "Why did this egg (pointing to the larger object) go down and the one (pointing to the smaller) stay up?" Responses to this question were recorded, along with the responses of the children to the certainty question. The *E* removed the two objects, held them suspended over opposite containers, and said, "Now, I'm going to drop this egg into that bowl, and I'm going to drop that egg into this bowl. Point to the egg that you think will sink, or go down. Point to the one that you think will float, or stay

up.” The children’s predictions were recorded, along with their responses to the measure of certainty. The objects were dropped as indicated, whereupon the Ss were asked, “What happened? The first time, this egg (pointing to the larger object) went down, but this time it stayed up. Why did that happen?” The explanations were recorded along with scores on the measure of certainty.

The second conflict-arousing event (the Inverted-Tumbler task) entailed the use of an ordinary, partially-filled water tumbler and a thin plastic disc somewhat greater in diameter than the mouth of the tumbler. The disc was placed over the mouth of the tumbler, which was then inverted. The Ss were asked, “What will happen if I hold the glass just this high, and take my bottom hand away? What will the water do?” Their predictions and expression of certainty were recorded. The hand holding the disc against the mouth of the tumbler was removed. The Ss observed that the water remained in the tumbler. They were asked, “Why did that happen?” Their responses to this and to the certainty measure were recorded.

Scoring

Responses to the certainty measure were assigned a score of 1, 2, or 3, in order of increasing certainty.

The predictions given by the Ss in the course of their encounter with the Floating task were scored as either “consistent” or “not consistent” with their immediately preceding explanations. For instance, if they initially held that the larger of the two objects sank because it was heavier, they were scored as “consistent” only if they predicted that the same object would sink in the opposite container, and as “not consistent” otherwise.

Explanations offered after the objects had been placed into opposite containers were placed in three ordered categories, namely, “Non-constructive” (NC), “Constructive” (C), and “Highly Constructive” (HC). None of the children offered entirely accurate explanations, including reference to the relative density of the objects and the media. Their accounts merely represent graded degrees of progress toward the acquisition of a formally operational conceptualization of the law of floating bodies. Those in the NC category failed to recognize that some difference between the media was involved. Typical of NC responses was, “Now the other egg is heavier.” Those in the C category held that there was more or less water in one of the containers. This form of explanation, though inaccurate, was more constructive than those which persistently centred on object differences and ignored other possible variables. More nearly accurate were explanations in the HC category, which referred to differences in the kind of media involved.

Results

The floating task was designed so that the more obvious difference between the objects was irrelevant, while the non-obvious difference between the media was relevant. Nearly all the Ss appealed to the more obvious differences between the objects in attempting to explain why one of the objects floated and the other sank when they were first placed in the media. Only one S, from the Selected Urban group, referred to any difference between the media. All the others referred to differences in the sizes, weight, or (very rarely) the amount of air contained in the two objects. Following the reversing of the objects, the Ss were again asked to explain why one floated and one sank. Table I shows the relative frequency of NC, C, and HC responses for the Selected Urban and Rural groups. A test of significance yield Chi-square equal to 13.9; $p < .001$. The responses of the two groups differ significantly, with the Selected Urban Ss tending to resolve the conflict more constructively.

TABLE I
CONSTRUCTIVENESS OF THE RESPONSES OF THE SELECTED
URBAN AND RURAL CHILDREN

	HC	C	NC
Selected Urban	10	30	7
Rural	3	19	22

As a routine procedure, with no clear theoretical basis, the responses of boys and girls were compared. The NC, C, and HC responses were treated as ordinal data, and a Mann-Whitney U Test, corrected for ties, was performed. The initial groups were combined, so that the comparison involves a total of ninety-one Ss, thirty-three of them girls and fifty-eight of them boys. The proportion of boys and girls was very nearly equal in the two groups. The Mann-Whitney U Test yielded at value of Z equal to 2.64; $p < .005$. The boys resolved the conflict significantly more constructively than the girls.

TABLE II
CATEGORIES OF NONCONSTRUCTIVE RESPONSES ON THE FLOATING TASK

	Selected Urban	Rural
Pseudo-explanations	1	6
Fabrications of Effects	3	8
Pleas of Ignorance	1	5
Other	2	3

Table II shows a classification of the forms of non-constructive responses. Most frequent among these is non-conservation. Eleven Ss in all, three from the Selected Urban and eight from the Rural group, said the amounts, sizes, or weights of the objects had changed after they

were reversed (e.g., “Now the other egg is heavier”). This is counted as a fabrication of data, in that even casual observation reveals it to have been non-present. (Recall that one object contained about twice as much substance as the other, and that on one occasion this object sank, while on the next it floated.) Second most frequent were pseudo-explanations. Pseudo-explanations are appeals to necessary, but non-sufficient, and only trivially relevant conditions (e.g., “You switched the eggs around”). This category was followed in frequency by pleas of ignorance, or simply, “I don’t know” responses. Only two Ss gave responses which could in no way have been construed as consistent with the observed effects, both holding that something was inside the same one of the two objects before as well as after their reversal. Also, only two gave what appear to be animistic accounts. One said, “The water brought one piece back up”; the other, “The water makes one piece stay up.”

After the Ss had given their first explanations, they were asked to observe while the objects were removed, reversed, and held suspended above opposite containers. Then they were asked to predict what would happen if the objects were placed into the containers. It was predicted that the Ss in the Selected Urban group would give a significantly greater proportion of “consistent” predictions than those in the Rural group.

TABLE III
CONSISTENCY BETWEEN INITIAL EXPLANATIONS AND
PREDICTIONS ON THE FLOATING TASK

	Selected Urban	Rural
Consistent	27	35
Not Consistent	20	9

Table III shows the results bearing on this prediction. Contrary to the predicted outcome, a greater proportion of consistent predictions was obtained in the Rural group.

On the Inverted-Tumbler task, the Ss were asked to predict what would happen when E’s hand, which was holding the disc firmly over the opening, was removed. Only one S from the Selected Urban and three from the Rural group predicted that the water would remain in the tumbler. After the hand which was holding the disc was removed, the Ss were asked to explain why the water did not spill out. Table IV presents the categories into which the attempted explanations were placed, along with the relative frequency of their occurrence in the two groups.

Pseudo-explanations and quasi-scientific accounts were the most frequently occurring categories, with the Rural Ss giving somewhat more of the former, and the Selected Urban Ss giving somewhat more of the

TABLE IV
CATEGORIES OF NONCONSTRUCTIVE RESPONSES ON THE
INVERTED — TUMBLER TASK

	Selected Urban	Rural
Pseudo-Explanations	14	21
Quasi-Scientific Accounts	17	12
Fabrications of Effects	5	4
Pleas of Ignorance	5	3
Other	4	4

latter. Again, pseudo-explanations state conditions which are necessary, but not sufficient, and which are only trivially relevant in accounting for the observed effects (e.g., “Because the lid is there,” or “Because the lid stayed on”). Quasi-scientific accounts consist of appeals to scientific or “scientific sounding” principles which are totally irrelevant or which have a remote relevance which is clearly not understood by the Ss (e.g., appeals to “water suction,” to “gravity,” or to the notion that “wet things stick”). Fabrications of effects are accounts which propose devices that are not present, and which even casual observation clearly reveals to be nonpresent (e.g., references to glue, tape, a magnet, or a mechanical attachment between the plastic disc and the tumbler). Pleas of ignorance are simply “I don’t know” response. Two Ss from the Selected Urban group gave accounts which were categorized as more constructive than any of the others. Both said that because no air could get into the glass, the lid could not come off. This response clearly reveals the concept of the invariance, or conservation, of the joint quantities contained in an enclosed space—that for a quantity of water to be removed, a quantity of air would have to take its place.

Each prediction and each explanation the Ss gave was followed by a question designed to measure how certain they were that their answers were right. To evaluate the construct validity of the certainty measure, it was first applied in situations where reasonably clear directional predictions could be made. For instance, one hundred and eleven first-grade Ss were given to two-item test of the concept of conservation of number. It was predicted that consistent conservers would be more certain of their conclusions than either consistent nonconservers or transitionals (those who alternated between conservation and non-conservation over the two items of the test). It was also predicted that consistent nonconservers would be more certain of their conclusions than transitionals. The certainty scores associated with the two items of the conservation test were summed, and the results for the twenty-eight nonconservers, twenty-four transitionals, and thirty-nine conservers were compared. A Kruskal-Wallis one-way analysis of variance yielded H equal to 128; $p < .001$. Individual comparisons between groups were

made with the Mann-Whitney U Test, corrected for ties. Comparing conservers and nonconservers, this test yielded Z equal to 3.112; $p < .001$. Thus, the conservers expressed significantly greater certainty than the nonconservers. For the comparison of conservers and transitionals, Z was equal to 3.32; $p < .001$. The conservers thus expressed significantly greater certainty than the transitionals. The value of Z did not reach significance in the comparison of nonconservers and transitionals.

Earlier in the present section it was reported that on the Floating task, contrary to the expected outcome, the predictions of the Rural Ss were more consistent with their previous explanations than were those of the Selected Urban Ss. Since it does not seem reasonable to suppose that the Rural Ss were simply better able to maintain consistency, an attempt was made to bring other available information to bear in accounting for this effect. One approach taken was to assume that when the Ss gave their initial explanations, referring to object differences, many of those in the Selected Urban group may have also been considering the possible effect of some difference between the media. It seems reasonable to suppose that this would have caused them to be less certain that their initial explanations were correct. Accordingly, they may have taken the occasion in which a prediction was called for as an opportunity to "cover" the possibility that media rather than object differences were involved. A second plausible interpretation is to assume that those in the Selected Urban group tended to expect a trick, and, consequently, gave inconsistent predictions.

An examination of the certainty scores provides no support for either of these interpretations. The certainty scores were distributed very nearly identically in the two groups. Thus, if members of the Selected Urban group tended to anticipate a trick, or were considering the possible involvement of differences between the media as well as between the objects, there is no depression of their certainty scores relative to those of the Rural Ss to indicate it. However, when the two groups are collapsed, a cross-classification of the three levels of certainty associated with the initial explanations and the two levels of consistency (e.g., consistent versus inconsistent) of their predictions yields Chi-square equal to 7.7; $p < .05$. Those who were less certain of their initial explanations tended to give more inconsistent predictions. An examination of the data reveals that this relationship is no less pronounced in one group than in the other.

Two comparisons are consistent with the hypothesis that Rural Ss are less capable than Selected Urban Ss of realistically evaluating the adequacy or inadequacy of their attempted explanations. First, even though the Selected Urban Ss resolved the conflict associated with the Floating task significantly more constructively than did the Rural Ss, the latter were just as certain of their explanations as the former. The

distributions of their certainty scores were very nearly identical. Secondly, on the Inverted-Tumbler task, which was so difficult to explain that the members of the two groups gave quite uniformly nonconstructive accounts, the Selected Urban Ss expressed significantly lower certainty than did the Rural Ss. A Chi-square test performed on a cross-classification of the two groups with the three levels of certainty yielded a value of 8.22; $p < .025$.

Discussion and Conclusions

From the explanations offered by the children in their attempts to account for the two conflict-producing events, it was possible to identify several reasonably distinct forms of nonconstructive conflict resolution. Of these, the most frequently occurring were pseudo-explanations, quasi-scientific accounts, fabrications of data, and pleas of ignorance. Far less frequent were such additional forms as animism and artificialism. The paucity of such forms may be in part due to the nature of the events, [and in part due to the nature of the events] and in part due to the nature of the culture. That is, with other events, the children of the present study may have resorted to such forms more frequently, or with the same events children of less science-oriented cultures may have shown a greater tendency to resort to such forms.

Among the main assumptions of the present study have been these: first, that the individual's standards for evaluating the adequacy or inadequacy of his attempts to explain events are acquired in part through a process of social transmission; secondly, that the Selected Urban children possessed more rigorous standards for evaluating the adequacy of their attempted explanations than did the Rural children; and, thirdly, that the more rigorous the individual's standards of adequacy, the less likely he will be to terminate inquiry and cognitive reorganization prematurely.

Evidence was obtained indicating that the Selected Urban children were on the whole, better able than the Rural children to evaluate the adequacy or inadequacy of their attempted explanations. The Rural children tended to express a rather uniformly high degree of certainty that their answers were correct, whether their answers were or were not, in fact, correct. However, when both groups were presented with a conflict-producing event too difficult for the members of either group to resolve constructively (i.e., the Inverted-Tumbler task), the Selected Urban children were significantly less certain than the Rural children that their answers were correct.

Moreover, when both groups were presented with a conflict-producing event which many of the children could resolve constructively (i.e., the Floating task), the Selected Urban children achieved significantly more constructive resolutions.

These outcomes are consistent with the position that children, such as the Selected Urban children, who possess more rigorous standards for evaluating the adequacy of their attempted explanations will be less prone to terminate inquiry and cognitive reorganization prematurely, and, consequently, will achieve more constructive resolutions. Further research is needed to test the hypothesis that children trained to avoid nonconstructive forms of conflict resolution will become more persistent inquirers and that they will, accordingly, achieve more constructive resolutions than children not so trained.

Two incidental outcomes of the study deserve to be mentioned here. First, in an attempt to evaluate the construct validity of the measure of subjective certainty, it was applied in connection with a two-item test of the concept of conservation of number, with a separate group of first-grade children. There were highly significant differences in the certainty expressed by consistent conservers and transitionals (i.e., those who fluctuated between conservation and nonconservation), and between consistent conservers and consistent nonconservers. No significant difference was obtained between consistent nonconservers and transitionals. Among conservers, it was very rare for a child to express anything but the highest level of certainty. These outcomes are generally consistent with those that would be expected on the basis of the extensive literature dealing with the various conservation tasks, except that one could argue that consistent nonconservers might be expected to express higher certainty than transitionals, who fluctuate between conservation and nonconservation.

The second incidental outcome deserving of comment is that boys tended to be superior to girls in constructively resolving the conflict associated with the floating task. The present writer also found¹¹ that boys consistently outperformed girls in a learning situation wherein three conflict-producing procedures were employed. These procedures were designed to prompt first-grade children to acquire the concept for conservation of number. The basis for the rather consistent superiority of boys in such situations is not clear to this writer at the present time.

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The purpose of this experiment was to test the hypothesis that a discontinuity of values exists between students, parents and teachers with respect to "success". The possibility of group differences in both the school and post-school situations were investigated. An instrument was employed in which respondents were required to order those factors considered to be of contributory importance to the achievement of "success"... It was found that there was no significant tendency for groups to differ in their expressed responses within the test situation. The hypothesis as stated was not upheld. It was observed that the design of the testing device should be altered to incorporate additional factors.

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Discontinuity of Values

Social scientists have demonstrated increased interest in educational institutions as evidenced in part by the research in both role theory and values. Naegele examined the role of the psychologist as perceived by the school system, with its own purposes, values and social structures.¹ Spindler discussed the current attacks on professional education as symptomatic of the transformation or shift from "traditional" to "emergent" values.² Walton undertook a theoretical study of Educational Administration,³ while Gross and others examined the role of the school superintendents.⁴ Naegele has also written a critical essay on the too mechanistic role assigned the superintendent in Gross's study.⁵ The attention of many educators has been focused on values by Getzel's "Changing Value Challenge the Schools",⁶ who stated that "the central serious issue facing education today, as it always has been, is the problem of values".

Chase and Anderson devote some seventy pages to concepts, values and criteria for the redirection of secondary schools.⁷ Getzels, speaking

to professors of educational administration at a National Conference held at the University of California, Berkeley in 1961 referred to conflicts in values in his address on "Role Theory and Educational Leadership", and identified these as arising from three different sources, community values, teacher values and student values, when those values held by each of these groups differ from the values of others. Such studies suggested that administrators and other educators might profit from examinations of their own school systems. Accordingly, the writers undertook the following study.

The specific purpose was an attempt to determine student, parent and teacher attitudes toward the matter of "success" as it relates to both in-school and post-school endeavours. The study was undertaken to test the hypothesis that divergence existed between the views of the three groups concerning factors which determine success. It is believed that there is often a significant though perhaps not recognized difference in the goals and values of the people directly concerned with education. Further, that what we teach and profess may not be what is actually needed by students for success. The question might be asked, "How can we direct students toward a successful life when teachers, pupils and parents may not entertain similar concepts concerning the nature of success itself?"

Method

Subjects

One hundred fourteen Grade IX high school students, seventy-nine parents and nineteen teachers served as Ss*. Two questionnaires were administered to a random selection of students, their parents and their teachers. Of those students answering the questionnaires distribution by sex was approximately equal. Participation was voluntary within the test situation. The questionnaires consisted of a series of six factors to be arranged in order of importance as they contributed to attainment of the stated objective. The alphabetically ordered list of six factors was left open-ended to allow respondents to include other factors if they so desired. Specific directions were given the subjects to re-arrange the factors in what they considered to be their order of contributory importance, and to include other factors in the list if they were considered by the subjects to be of sufficient importance. No definition of the term "success" was included in the test instrument.

The six factors included in the questionnaire were as follows: (1) Creativity, (2) Hard Work, (3) Intelligence, (4) Marks, (5) Money, (6) Popularity. Additional factors could be added at the discretion of the respondent. The single distinguishing characteristic between the two forms of the questionnaire is indicated in the questions asked, i.e.:

*The authors are indebted to both the parents who participated and also to the principal, staff, and students of West Vancouver Secondary School for their cooperation at the time of this study.

Form A: (In-school) “What do you consider makes for success in High School?”

Form B: (Post-school) “What do you consider makes for success after High School?”

Procedure

Initial test. Students and teachers were asked to respond to Form A of the questionnaire in the school setting. Parents of those students involved received copies of the same questionnaire.

Control period. A span of 30 days was allowed to elapse prior to the administration of Form B of the questionnaire. This procedure was followed to reduce or perhaps eliminate any association between responses to the respective forms of the instrument.

Final test. Identical procedures were employed during this test with all subjects answering questionnaire Form B.

Results

To complete the analysis of the results it was felt that a statistical evaluation of the inter-group differences in response patterns was desirable. The following comparisons were considered important:

- a. Opinions of all respondents regarding success *in* school contrasted with their opinions regarding success *after* school.
- b. Opinions of teachers, parents and students inter-compared for both the *in* and *post* school situations.

In order to make statistical calculations, points were awarded to the selections made by the respondents as follows: nine for the first ranking, eight for a second ranking and so on down to one for the ninth or lower ranking. Using this system totals were developed as shown in Table I.

TABLE I
RESPONSES OF TEACHERS, PARENTS AND STUDENTS
IN-SCHOOL SUCCESS

Factor	Responses							
	Teachers		Parents		Students		Total	
	Score	%	Score	%	Score	%	Score	%
Creativity	109	14.4	533	17.9	742	16.2	1,384	16.7
Hard Work	150	19.8	650	21.8	971	21.3	1,771	21.4
Intelligence	151	19.9	560	18.8	830	18.2	1,541	18.6
Marks	98	12.9	410	13.8	709	15.6	1,217	14.7
Money	64	8.4	290	9.7	405	8.9	759	9.2
Popularity	85	11.2	386	13.0	560	12.3	1,031	12.4
Others	102	13.4	150	5.0	340	7.5	592	7.0
TOTALS	759	100.0	2,979	100.0	4,557	100.0	8,295	100.0

Factor	POST SCHOOL SUCCESS							
	Responses							
	Teachers		Parents		Students		Total	
	Score	%	Score	%	Score	%	Score	%
Creativity	107	16.5	556	17.0	672	15.1	1,335	15.9
Hard Work	117	18.1	645	19.7	900	20.2	1,662	19.8
Intelligence	108	16.7	689	21.0	847	19.0	1,664	19.6
Marks	72	11.1	408	12.4	655	14.7	1,135	13.5
Money	40	6.2	334	10.2	482	10.8	856	10.2
Popularity	69	10.7	395	12.1	558	12.5	1,022	12.2
Others	134	20.7	249	7.6	343	7.7	726	8.7
TOTALS	647	100.0	3,276	100.0	4,457	100.0	8,380	100.0

The data in Table I reveals, without the aid of statistical tests, that neither teachers, parents nor students indicated any strong tendency to assert that the factors contributing to “In-school” and “Post-school” success are significantly different. Chi-square techniques were used to determine whether the pattern of responses related to *post school* differed significantly from the pattern related to *in school*. Percentages of the scores for each of the seven factors in the *in school* table served as f_e , with the percentages for the *post-school* situations as f_o . The chi-square value obtained in this comparison was only 1.54. This value does not approach significance, thus suggesting that opinions held regarding success after school do not differ to a great extent from opinions regarding success *in school*. Chi-square techniques were also used to examine the inter-group differences in response patterns among teachers, parents and students. These differences were considered separately for the *in* and *post-school* responses and the results are summarized in Table II.

TABLE II
COMPARISON OF TEACHERS, PARENTS AND STUDENTS RESPONSES
In-School Success

	χ^2	P
Teachers vs. Parents	6.68	n.s.
Parents vs. Students	1.76	n.s.
Student vs. Teachers	5.72	n.s.
Post-School Success		
Teachers vs. Parents	12.51 (1.89)	$p < .05$
Parents vs. Students	.85	n.s.
Student vs. Teachers	25.67 (2.88)	$p < .01$

Table II shows that while there are no significant differences among the three categories of respondents with respect to “In-school success” significant differences occur in the case of “Post-school success.” Teachers responded markedly differently from both parents and students. However, examination of the questionnaires completed by teachers showed that they differed from the other respondents primarily by

indicating a large member of "other" factors relevant for post-school success.

Using the scoring system outlined, parents and students awarded only 7.6 and 7.7 per cent respectively, of their "votes" to responses lumped together as "other", while teachers awarded 20.7 per cent to this category. Therefore, in the statistical comparisons the largest contributor to the high chi-square values was the "other" category, when teachers were compared with students and parents. When these chi-squares were re-worked ignoring the "other" responses the values obtained were 1.89 and 2.88 (See bracketed numbers in the table) for teachers versus parents and students respectively. It is obvious that the teachers were least satisfied to respond within the confines of the questionnaire presented. Whether this shows a real difference between teachers and the other groups is, however, open to question.

Conclusions and Discussion

The research presented affords direction for future study and, while it was not the investigators' original intent, the undertaking has served as a pilot study. It had been expected that the study would yield evidence of discontinuity of values between the groups involved to corroborate the findings of similar studies. The results do not uphold the stated hypothesis.

A similar study incorporating modifications in the questionnaire as suggested heretofore should be undertaken in areas which are of a different socio-economic character. The average income of families in the school district involved was, at the time of the study, in the neighbourhood of \$10,000 per annum. The socio-economic status of the teachers though not specifically ascertained was in the upper-middle class income range. It is the present intention of the writers to pursue this question in districts which exhibit marked differences in socio-economic levels.

A definition of the term "success" was purposely excluded from the format of the questionnaire because it was felt that such qualification might tend to influence the responses provided by the subjects. The varying ages and experiences of the respondents also suggested the omission of description concerning the term "success".

Respondents, the parent group in particular, volunteered a large number of comments to quality and amplify their answers. Many of these remarks provide interesting reading and further insight into the problem. It is not within the scope of this presentation to attempt to order or analyse responses of this kind. The comments do, however, suggest that the limits of the questionnaire should be extended to include many more choices.

Any discussion of this study should include a consideration of the design of the survey instrument. An examination of the responses suggests that a large number of respondents, particularly the teachers, were not satisfied to respond to the questionnaire as presented, but felt the necessity of adding responses which have been lumped as "other" for the statistical treatment.

Again, it seems that if more choices had been presented by the original instrument, opinions regarding these could have been evaluated in a more standardized manner. With the results obtained there is room for doubt that the value systems of the groups concerned were actually examined.

The objective of the study was to examine the presence or absence of a discontinuity in the value systems of selected students and their parents and teachers. The differences in response patterns among the three groups may suggest differences in the approach to the questionnaire. However, for the questionnaire presented, there seem to be no grounds for the assumption of a discontinuity of values among the students, parents and teachers surveyed.

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We may be said to be living in an age of re-evaluation of John Dewey. In this article Dr. Bhattacharyya examines a number of passages from those books written by Dewey which are well known to educators. He attempts to determine what Dewey did say to the teacher and to point up inconsistencies and misdirections that may stem directly from Dewey rather than from the many misapplications of him that are so often advanced as reasons for the supposed failure of progressive education. The article points very clearly to a central problem—the great difficulty encountered when an attempt is made to determine clearly what Dewey did say and what he meant.

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The Role of the Teacher in John Dewey's Educational Theory

The teacher comes in smiling and pleasant, thereby hoping to win the confidence and co-operation of her students. "What shall we do today, children?" she says. When somebody suggests Cops and Robbers . . . , the teacher gently insinuates the suggestion that perhaps the children should enact one of the great battles. And so it goes with history.¹

The role of the teacher in John Dewey's educational programme has been for many years a subject of great controversy. The very richness of Dewey's writings (a recent bibliography listing all the titles runs to 153 pages), the rather unfortunate selection of words and phrases, Dewey's "lumbering and bumbling" style, and the inevitable distortions by "disciples" and unsympathetic critics are among the explanations generally offered for this and similar lingering controversies around John Dewey's basic philosophical doctrines and educational proposals. While agreement or harmony cannot be said to be a normal feature of the ordinary controversial life of philosophy or philosophy of education, the roots of disagreement about Dewey are exceptionally deep. His teachings, which, once met with too much uncritical acceptance, especially

in the United States, are currently under strong attack there. And while the critics and the admiring rescuers debate about "the real Dewey", their verbal skirmishes seem only to succeed in making Dewey more obscure to the non-partisan observer. For, in disputes of this kind the many problems of interpreting Dewey are quite often overlooked. Do we, for instance, comment on Dewey as a whole, consider his doctrines as all of a piece? Or, do we study his views in historical contexts, in the context of problems and purposes from which he set out? There may be, beside the understandable difference of emphasis at different times, manifold conflicts of doctrine and purpose within Dewey. It is also quite possible that there are serious inconsistencies and vagueness in Dewey's own thinking on many matters. But these problems of interpretation are either overlooked or glossed over in commentaries looking around for neat and clear-cut conclusions in Dewey's prolific writings.

In what follows I shall try to read some of Dewey's significant comments "about the province and office of the teacher" in his recommended educational procedure, and analyze them briefly in the context of his important educational concepts and relevant philosophical doctrines. It is hoped that this will at least enable us to see why educators, even those who claim to be his followers, tend to read Dewey's words in very different ways.

PLAN FOR A NEW METHOD: *The Child and the Curriculum* (1902)

While the thesis of *The Child and the Curriculum* is that there is no strict "either-or" disjunction between the child and the course of study, Dewey's arguments do not overlook the presence of the teacher in the classroom. Dewey argues against leaving the young learner "entirely alone", to his own unguided spontaneity. He does not think that the child's "present powers and interests" are "something finally significant in themselves". He says:

It will do harm if child-study leave in the popular mind the impression that a child of a given age has a positive equipment of purposes and interests to be cultivated just as they stand.²

Dewey, in the same context, points out the possible danger of taking the idea of development in "altogether too formal and empty a way". A child cannot think or work things out for himself "without being supplied . . . environing conditions which are requisite to start and guide thought". Guidance is rather crucial, for development means, as he says, getting something "that is really wanted". This requires that "educative medium" be provided to "enable the powers and interests that have been selected as valuable to function". Clearly, this selection is to be made by an adult, to all appearance, by the teacher, but the emphasis on "medium", i.e., suitable experiences, is also to be noted. For, according to Dewey:

The problem of direction is . . . the problem of selecting appropriate stimuli for instincts and impulse which it is desired to employ in the gaining of new experiences.³

There is also the question of determining what new experiences are desirable. The child does not know them, nor is he aware of the direction in which to seek them. Dewey writes:

What new experiences are desirable, and thus what stimuli are needed, it is impossible to tell except as there is some comprehension of the development which is aimed at; in a word, as the adult knowledge is drawn upon as revealing the possible career open to the child.⁴

Toward the end of this short essay in summing up the arguments for the child and the curriculum, Dewey writes:

Now the value of the formulated wealth of knowledge that makes up the course of study is that it may enable the educator to *determine the environment of the child*, and thus by indirection to direct. Its primary value, its primary indication, is for the teacher, not for the child. It says to the teacher: Such and such are the capacities, the fulfilments, in truth and beauty and behavior, open to these children. Now see to it that day by day the conditions are such that *their own activities* move inevitably in this direction, toward such culmination of themselves.⁵

Dewey's main purpose in this early work was to develop a new curriculum, a new organization of the course of study that would begin with the experience of the young learners. However, we can also read in the work, as in the passages quoted above, Dewey's other suggestions including his recommendations on guidance and direction in education, and his emphasis on children's *own* activities. These were clearly recommendations concerning practice, and were taken as such—not as mere matters of emphasis at a given time—by many of Dewey's "progressive" followers; and in the context of Dewey's theoretical formulations these recommendations were destined to become the source of considerable confusion. Let us see how.

Dewey suggests that the teacher's mastery of knowledge will give him the sense of direction and thereby enable him to guide the experience of children. This means, in other words, that the teacher knows the desirable, what is "really wanted" and what ends are to be fulfilled. Now, we can assume that the teacher knows how to *use* (in Deweyan fashion) the knowledge of subject-matter to construct through inquiry the desirable in a specific given situation. This seems necessary if the teacher is to set up "appropriate" learning situations for the pupils. But at the same time we shall be clearly wrong if we assume that the teacher in any way determines the desirable, which in terms of Dewey's philosophy the child should construct himself out of his own experiences. If, as according to Dewey, "educational process has no end beyond itself; it is its own end",⁶ in other words, educational activity is not aimed at any future goal, what can we make out of such expressions as "the development which is aimed at" and "possible career open to the child"?

Dewey also suggests that direction should come from "appropriate stimuli"; he, therefore, requires the teacher to arrange conditions for

children in such a manner that "*their own activities* move inevitably" in the direction of truth and beauty and whatever else "the world now holds as its own". How should we interpret the emphasis on children's *own* activities? According to Dewey, all learning is knowing and knowing is discovery. A child learns what he himself discovers in his own dealing with experiences that interest him, and in the way they interest or motivate him. Allowing for the fact that the material for such experiences are supplied by the teachers, can we assume that the child's own discoveries or goals will always and progressively be in the direction his teacher believes to be desirable? And, what does the word "inevitably" mean? Is it, as some writers maintain, one of the "puzzling items" in Dewey's literary style, or his considered position? Dewey talks on occasions about education as growing, as reconstruction, without any great concern about the direction of growth. Does he assume that all *ad hoc* growth or reconstruction can inevitably be for the better? What is the guarantee that a child's own activity, i.e., activity consonant with his *own* goals, will lead in the same direction the adult or the teacher believes the "desirably" to be?

CONCEPT AND ARGUMENTS: (*Democracy and Education* (1916))

Anyway, it follows that the teacher will so arrange the classroom programme that the young are provided with every opportunity to engage in activities which are educative. Since the teacher must not arbitrarily impose his own views or values on the children, how will he determine what activities or experiences are educative and what are not? At one point Dewey seems to offer some criteria to judge the educational value or worth of an activity. He says:

We may say that the kind of experience to which the work of the schools should contribute is one marked by executive competency in the management of resources and obstacles encountered (efficiency); by sociability, or interest in the direct companionship of others; by aesthetic taste or capacity to appreciate artistic excellence in at least some of its classic forms; by trained intellectual method, or interest in some mode of scientific achievement; and by sensitiveness to the rights and claims of others—conscientiousness.⁷

To this, however, he immediately puts a "But". "But", he says "it is a great mistake to regard these values as ultimate ends"; and a few sentences later, "They are not in any true sense standards of valuation".⁸ What does all this mean? Dewey seems to give the teacher, on the one hand, a set of criteria found, as he says, "in the *specific realizations* which form tastes and habits of preference", while on the other hand telling him that these "surveyed aims" are not really goals to aim at, these "values" are "not in any true sense standards of valuation". Although these values are "of significance as points of view elevated above the details of life", it will be a great mistake, he warns in the same context, to regard them as ends "to which concrete satisfactions of experience

are subordinate". If all these seem somewhat paradoxical, they are nonetheless revealing.

For Dewey, education is not a preparation for the future, not a movement toward any fixed goal. Education is a continuous reconstruction of experience, and any "specific realization" of experience is as valuable as any other. Education is, therefore, a process; it is continuous growing; and like growth, it is not *having* an end, but *being* an end. "Since in reality there is nothing to which growth is relative save more growth, there is nothing to which education is subordinate save more education".⁹ In another passage, Dewey says:

Our net conclusion is that life is development, that developing, growing, is life. Translated into educational equivalents, this means (i) that the educational process has no end beyond itself; it is its own end; and that (ii) the educational process is one of continual reorganizing, reconstructing, transforming.¹⁰

These and similar passages seem to imply that education as a continuous process needs no external or ulterior warrant at any stage for its justification. And also, there cannot be, strictly speaking, a completed education or an accomplished growth at that will be "an Ungrowth, something which is no longer growing".¹¹ But does this conception of education at all indicate what sorts of experience are educative and why are they so? Commenting on the above passage John L. Childs, a close follower of Dewey, admits:

Put to the test of actual educational experience this conception of education as its own end has been found to possess a certain ambiguity . . . Put in this extreme form, the principle signifies the negation of adult guidance, and is thus contradictory to the very essence of deliberate education.¹²

There is, however, no reason to suppose that Dewey ever assumes education to be an "aimless" process of experiencing. On the contrary, in his way of thinking education is clearly oriented to "progressive" moral and social outlooks and values. The problem is, Dewey's philosophy prevents him from asserting anything definitely to be the end of the process of education. He recognizes that deliberate education requires selection of material and direction, and that such matters cannot entirely be left to adult whims either; but he is unable, in terms of his theory of valuation, to prescribe anything but growing, the reconstruction of experience—a *function*—as "the only good". For, if one believes in Dewey's philosophical doctrine that ends and standards are constructed from within the process of on-going experiences, why should one accept any proposed model of aims or adopt a given set of criteria? And when one does so, how does this approach to educational goals differ from the so-called traditional approach, except probably in the nature of the goals sought? It may be recalled that Plato had a somewhat similar conflict of doctrine and purpose which he tried to overcome by turning the philosopher, a searcher of truth, into a possessor of Absolute Truth, and setting him on the political throne.

Since according to Dewey there is nothing native to human nature, education cannot be conceived as “unfolding” from within of capacities or goals “immanent” in human life. On the other hand, speaking of education as growth or taking the process of education itself as the end, does not seem to solve the concrete problems of deliberate education. However, there is another important element in Dewey’s conception of education. He is, as we have noted, continually preoccupied with the concrete satisfaction of present experience. According to him, “concrete satisfactions of experience” are not subordinate to any so-called aims or goals of education. Now, in suggesting this, is Dewey simply reacting against the traditional authoritarian methods of education, or is he recommending the “concrete-satisfactions-of-experience” itself as an end-in-view of the educational process? If the latter is the case, the teacher can very well posit these satisfactions as the foundation of the educational process. And consider, in this connection, Dewey’s recommendations concerning “Valuation of Studies” in *Democracy and Education*. “In the first place”, he writes, “as long as any topic makes an immediate appeal, it is not necessary to ask what it is good for.”¹³ Dewey seems to mean that any subject or topic or material that has an immediate appeal to the child, or anything to which the child eagerly responds, is a “just good” or a value in itself. It is not necessary in such cases, as he clearly says, for the teacher or pupil to “point out some definite assignable future use to which it is to be put” to justify its value. When pupils are genuinely concerned in learning Latin, that is of itself proof that it possess value”.¹⁴ To the reader, in the first place, the notion of a “just good” will appear a little strange; in his theory of valuation Dewey persistently refuses to admit of any object or phase of life as “just good”. And, in the second place, as Richard Hofstadter comments:

If for “Latin” one substitutes “driver education” or “beauty culture”, considering each as justified if it makes “an immediate appeal,” one senses the game that later educators played with Dewey’s principles.¹⁵

The need for mobilizing the child’s own interests for learning is understandable, but there is little clue to discriminate between superficial interests and interests whose cultivation can liberate the mind.

And liberating how? Not by supplying ready-made “ideas” but by making the learner discover, through activities generated by specific situations, answers to his own problems. The assumption is that learning is original thinking, “creative originality”. The “educational moral” of this conception of learning has, according to Dewey, considerable bearing on the nature of teacher-learner relationship in an educational activity. He says:

When the parent or teacher has provided the conditions which stimulate thinking and has taken a sympathetic attitude toward the activities of the learner by entering into a common or conjoint experience, all has been done which a second party can do to instigate learning. The rest lies with the one

directly concerned This does not mean that the teacher is to stand off and look on . . . but participation, sharing, in an activity. In such shared activity, the teacher is a learner, and the learner, is without knowing it, a teacher . . . and upon the whole, the less consciousness there is, on either side, of either giving or receiving instruction, the better.¹⁶

The moral, in other words, is that the teacher must, without "inserting" truth from outside or "imposing" external goals, participate and share in the activities of children. Much of it we can accept, but the teacher will still need more definite ideas about *how* he should participate, and in *what* kind of activities he should participate. The problem is not as much with children's activities and teacher's participation, as about the *nature* of them.

Dewey's own vagueness is understandable in the light of his moral theory and the conception of education as "growth". One can even say that the absence of direct commitment is quite consistent with his basic philosophical and educational conceptions. Certainly this leaves the teacher free to decide about classroom activities and direction. But on the other hand, and not surprisingly, it also allows for serious disagreement on those elements in Dewey's teachings which each teacher may consider essential for the progressive liberation of creative intelligence.

THE ATTEMPTED CLARIFICATION: Experience and Education (1938)

Dewey's latest discussions on education are aimed at rescuing his philosophy of education from many alleged misconceptions, and they record his reactions to certain developments in the activity schools of the "newer education". Writing in 1926 (only ten years after the publication of his most influential work *Democracy and Education*), on the problem of the relation of "individuality and its adequate development to the work and responsibilities of the teacher", Dewey says:

There is a present tendency in so-called advanced schools of educational thought . . . to say, in effect, let us surround pupils with certain materials, tools, appliances, etc., and then let pupils respond to these things according to their own desires

Now such a method is really stupid. For it attempts the impossible, which is always stupid . . . Since the teacher has presumably a greater background of experience, there is the same presumption of the right of a teacher to make suggestions as to what to do, as there is on the part of the head carpenter to suggest to apprentices something of what they are to do.¹⁷

Whether the "present tendency" Dewey complains of has been partly the result of his own teachings or not, it is for the historian to say. But we can see that here the teacher has become "the head carpenter"; he is still a sharer and learner, but now he has "a positive and leading share in the direction of the activities".¹⁸ The emphasis is on his "peculiar responsibility for the conduct of the interaction";¹⁹ it is his "business . . . to see in what direction an experience is heading".²⁰ The educator is also urged to evaluate his present work with reference to "a future whose objects are linked with those of the present".²¹

Consistently enough, there is also the warning against any direct equation between experience and education. "For some experiences are mis-educative".²² It is the *quality* of the experience that is important. The quality of experience has two different aspects, the immediate aspect of agreeableness or disagreeableness, and its effect upon later experiences. And, Dewey says:

The *effect* of an experience is not borne on its face. It sets a problem to the educator. It is his business to arrange for the kind of experiences which, while they do not repel the student, but rather engage his activities are nevertheless, more than immediately enjoyable since they promote having desirable future experiences.²³

Clearly, Dewey is repudiating a strict "either-or" approach between the immediately enjoyable and the desirable future effects. He is also maintaining that learning through activity is not incompatible with "thoughtful planning in advance" nor is the educator's "long look ahead" with the "legitimate freedom of those being instructed". All this is quite clear. But there is a problem.

Once we give up the "immediately enjoyable" as the sole criterion for educative experience and begin considering the *effects* of present activities upon later experiences in measuring the educational results of these activities, we come to face the problem. How do we know, in the context of Dewey's theory of valuation, what future experiences are worth having? That present experiences will have effects in the future cannot be doubted, but how do we ascertain now what kind of future growth is desirable? The teacher, if he is to fulfil the assigned role, must know the specific content of a present value judgement about growth.

Dewey tries to supply the answer we need. In one well-known passage he says:

That a man may grow in efficiency as a burglar, as a gangster, or as a corrupt politician, cannot be doubted. But from the standpoint of growth as education and education as growth the question is whether growth in this direction promotes or retards growth in general. Does this form of growth create conditions for further growth, or does it set up conditions that shut off the person who has grown in this particular direction from the occasions, stimuli, and opportunities for continuing growth in new directions?²⁴

This is clearly a rejection of "present-ism" in education. But does this passage contain anything to specify direction? Is it possible, without admitted allegiance to certain pre-conceived aims, to translate this passage as a guide to classroom practice and school policy? How do we know, when in terms of Dewey's philosophy we are not supposed to look beyond an end-in-view that arises in the mind as a response to a specific problematic situation, whether a particular growth will promote or retard growth in general? And what, after all, is "growth in general"? It is possible that a particular growth in one direction will promote further growth in some directions while retarding growth in some other directions. Which way to choose? How do we determine what would

contribute most to "growth in general?" And above all, how does this notion of growth and further growth determine the *nature* of growth, that is to say, introduce the idea of desirability and the sense of direction? For it is possible to conceive the process of growth with "an added capacity for growth" at every stage going merrily in the wrong (i.e. undesirable) direction. Has not the *Devil* grown?

And, quite apart from the moral ambiguity (about "new directions") but equally important, perhaps, is the need for some criteria to determine the kind of experiences that are good for creating conditions for further experiences. We may, as John L. Childs points out, agree with Dewey that whatever:

has the tendency to promote "growth in general" is desirable and therefore good, and still feel the need of *definite standards* by which we can distinguish experiences which have this "leading on" potentiality from those that do not possess it.²⁵

One criticism of progressive education has been that many school teachers failed to distinguish between "fads and frills" and activities that were "more truly educational". If this distinction did not bother the educators, many of them must have been quite confident that they were only following the directions of the scoutmaster. If "in the abstract . . . there is no such thing as degrees or order of value", and consequently, "We cannot establish a hierarchy of values among studies",²⁶ there is then no sure way of distinguishing the educational worth of a course in mathematics and one on "How to be liked".

Concluding Remarks:

Dewey has been concerned primarily with the formulation of general principles and only indirectly with their concrete, practical application. These principles are abstract and far-reaching, and Dewey realizes that "everything depends upon the interpretation given them as they are put into practice in the school."²⁷ He observes that "the general principles . . . do not of themselves solve any of the problems of the actual or practical conduct and management of progressive schools."²⁸ Dewey also believes that these principles are not mere projections of arbitrary personal preference but are grounded in "a comprehensive philosophy".²⁹ He, therefore, emphasizes the need for a background philosophy, and recommends that these general principles and the problems which they may raise "have to be worked out on the basis of a new philosophy of experience".³⁰ If this means, as it most probably does, that Dewey's educational principles are to be read, understood, and worked out in the light of his philosophical theories, this will not, as we have seen, help us to avoid the difficulties of interpretation. For, Dewey's philosophical position is vague and weak at crucially important junctures; it does not provide much logical support to many of his educational proposals.³¹ We should also note that even where the philosophical formulations are

sounder, a wide range of difference can very well exist with regard to the practical educational meaning of descriptive theoretical formulations.

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This study reports the results of a specially designed test of Four Spatial Concepts which was administered to one hundred twenty elementary school children from grades one to six inclusive in order to study the development of concepts of a reference system, distance, direction and scale. Developmental stages were identified and compared to those found by Piaget and others.

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Spatial Concepts of Elementary School Children

Introduction

Programmes of study which fail to take account of the processes involved in children's concept formation tend to be ineffectual and a waste of time. Consequently, there is increasing interest concerning the manner in which children think and the way in which they develop concepts. Of the many conceptual areas which have come under investigation, that of the child's conception of space has particular relevance to learning in a number of school subjects. For example, a child's inability to distinguish between an object and its mirror image has important consequences for his perception and comprehension of letters, numbers, words, geometric figures and other spatial configurations. In terms of school subjects, the child's development of a concept of space affects his performance in arithmetic, reading, writing, art, map work and other areas.

In the investigation reported here, four spatial concepts were examined to determine their effect on a child's ability to read and interpret maps. The selected concepts were *reference system*, *distance*, *direction* and *scale*. These were considered fundamental to map reading and interpretation for the following reasons. A child cannot locate one point on a map relative to another point unless he possesses and utilizes a reference system. Since locations are expressed in terms of their distance and direction from other locations, concepts of distance and direction are also

needed. Scale is important because distances between points on maps change according to the scale used.

The development of the four concepts was examined together with the effect of such factors as sex, socio-economic status, intelligence, grade level and chronological age. It was hypothesized that there would be no significant correlation between each of the spatial concepts and the separate factors.

Background and Significance of the Study

Before a child can interpret the meaning and recognize the significance of the information contained on a map, he must be taught how to read the map. As Kohn has put it, "children need to learn how to read maps before they read maps to learn".¹ Since maps play such an important role in geography and social studies programmes, several educators have suggested that map readiness programmes should be developed to give children experiences with maps as early as possible. However, while most authorities agree that map study can profitably be introduced in the primary grades, there is widespread disagreement as to *what* skills should be introduced and *when* the best time for their introduction might be.

Kohn has pointed out that "special efforts must be made to develop particular skills at a time when the student is mentally capable of understanding a certain concept".² However, very little research has been conducted in this area and all that is available at present are suppositions about what is or is not too difficult for various groupings. Consequently, the sequencing of existing map study programmes has been based on limited observation and a paucity of research evidence.

Among the few studies which have dealt with children's spatial concepts, that of Piaget³ stand out as the most extensive. In discussing the development of a system of references for the orientation of objects in space, Piaget claims that it is not until the level of formal operations (age eleven or twelve) that the construction of true co-ordinate systems or frames of references can occur. Based on his investigation of the development of a concept of a natural axis system,⁴ Piaget states that this develops in three successive stages the last of which is completed at the age of approximately seven. He further states that the development of a concept of scale begins at about the age of seven to ten but is not complete until the ages of eleven to thirteen.

Piaget's work has been subjected to considerable criticism due to his sampling and experimental techniques and researchers who have attempted to replicate and validate his findings have met with varying degrees of success. Rivoire⁵ and Satterly⁶ have observed Piaget's stages for the development of the concept of a reference system but both researchers found that the development occurred much later than Piaget had claimed.

Similarly, Sorohan⁷ found the concept of scale appeared later than the ages Piaget had specified. The present study attempted to resolve some of this conflicting evidence and to determine the relationship between the development of four spatial concepts and each of the factors of sex, socio-economic status, grade level, intelligence and chronological age.

Experimental Design

A battery of tests called "The Test of Four Spatial Concepts" was designed by the investigators and administered individually to a sample of one hundred and twenty children in grades one to six inclusive. The sample consisted of twenty children from each grade level with sex equally represented for each grade. The children ranged in age from six to twelve years and were enrolled in the Edmonton Public School System when the testing programme was carried out during May and June, 1965.

The Instrument

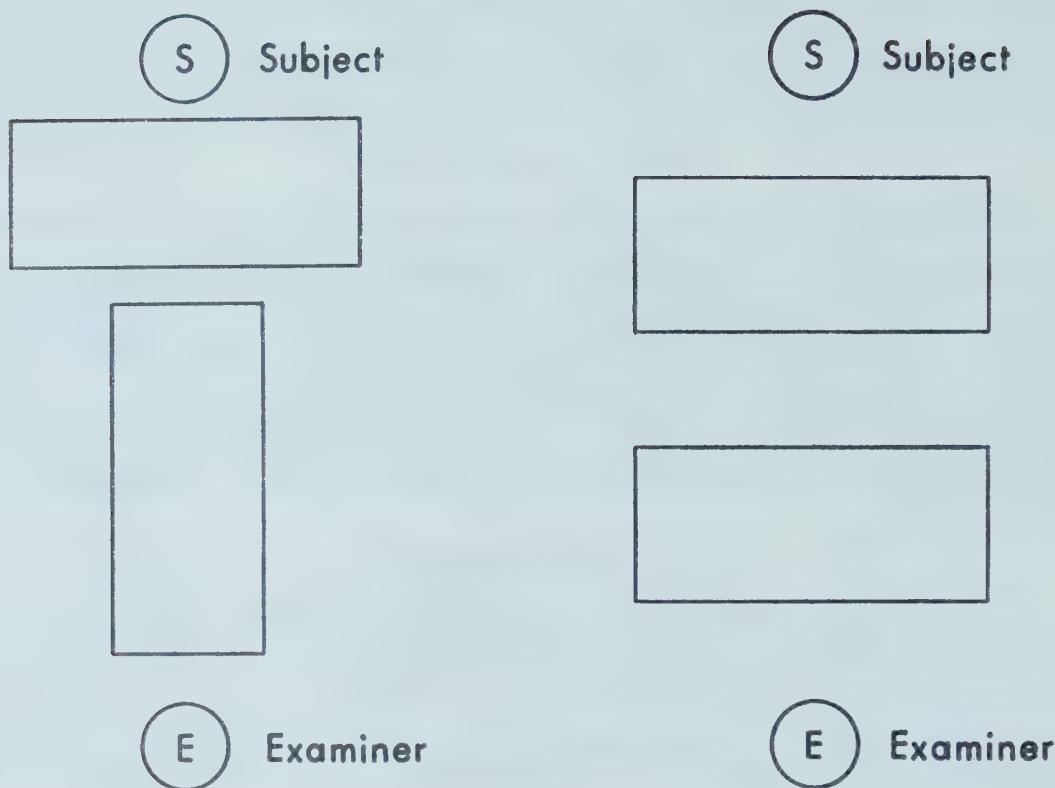
Each child was involved in two separate testing situations. In the first, an intelligence test was given and in the second the Test of Four Spatial Concepts was administered. The latter consisted of five subtests and a total of thirty items each of which required the child to manipulate certain objects in making his/her response. The subtests were presented as follows:

Subtest I—Artificial Axes: This subtest contained eight items and was designed to measure the subject's development of the concept of a reference system utilizing artificial axes. It was hypothesized that if a child had developed the concept of a reference system involving such axes, he would be able to use them to replicate the configuration of a pattern of markers. The apparatus consisted of four cards which contained varying degrees of cues to artificial axes systems and four configurations in the form of patterns of markers. The test required the child to replicate each configuration on a card with the same degree of axes cues but no markers.

In each case, the cards were presented in two orientations. First, the cards were placed so that the card with the pattern of markers was turned 90 degrees relative to the blank card in front of the subject. After the subject had attempted all four items in this manner, the rotated card was placed parallel to the blank card and the child repeated the sequence. The cards were rotated in an attempt to discover (1) whether the subject would take account of the discrepancy in orientation, (2) if he could mentally align the two cards, and (3) which orientation would be most difficult. The positions of the cards are shown in Figure I.

Subtest II—Distance: This subtest was designed to measure the subject's concept of distance and contained five items. Pairs of objects with specified distances between them were placed on a table before the

FIG. 1



Subtest I Rotated Orientation

Subtest I Parallel Orientation

child, who was asked to observe the distance and then set the objects up again with the same distance separating them.

Subtest III—Natural Axes: Patterned after a test used by Piaget, this subtest contained nine items and was designed to measure the concept of a natural axis system. The apparatus consisted of a number of objects and two model farms separated by a screen. The test required the subject to observe the placement of an object on one model and then to place a similar object on the second model in the same location. The second model was rotated 90, 180, and 270 degrees to prevent the subject from using his own position relative to the model as a guide for placing the objects.

Subtest IV—Direction: This subtest, designed to measure the concept of direction, contained three items. The apparatus consisted of a pair of identical models of a crossroads and fields separated by a screen. The subject was shown a direction on one model and was required to indicate this direction on the second model which, in the meantime, had been turned 90, 180 and 270 degrees consecutively.

Subtest V—Scale: This subtest contained five items and was designed to measure the concept of scale. The apparatus consisted of a model farm and five cards upon which cardboard shapes of various sizes were

fastened. These shapes represented buildings which were placed on the model farm. The test required the subject to choose the correct size of building from a group of five sizes.

Scoring

The artificial and natural axes subtests (subtests I and III) were scored by means of plastic overlays which allowed an error of one-half inch in the placement of each object. If the object was placed within this margin of error, a score of one was assigned, otherwise the score for that item was zero. In the subtests on distance, direction and scale (subtests II, IV and V), a score of one was assigned for each correct answer and zero for each incorrect response.

Statistical Analysis of the Results

To determine the internal consistency of each subtest, the inter-correlations of the subjects' scores on each item were computed. This analysis showed that each of the subtests on natural and artificial axes and the subtest on direction measured separate factors but that all the items in a given subtest were highly related. In the case of the subtest on distance, the analysis revealed that no one common factor was being measured but that in general, the subjects viewed the items as distinct from each other. Results for the subtest on scale indicated that three of the five items measured a common factor but the two items which involved non-rectangular shapes were not related. This was interpreted to mean that a subject's correct choice of one of the rectangular shapes led to a high probability that he could correctly choose the scale for the other two. This relationship did not hold in the case of non-rectangular shapes.

The research hypotheses were tested by examining the intercorrelations between each subject's scores on the Test of Four Spatial Concepts and his/her sex, socio-economic status, grade level, intelligence and chronological age. Because there was a possibility that subjects' scores within a grade level might vary according to sex if intelligence was held constant, a two-way analysis of covariance was computed. This analysis showed that the difference between the means of the sexes in any grade level was not statistically significant in the development of the four spatial concepts.

Summary of Findings

1. No significant correlation was found to exist between sex and the development of the four concepts. The part of this finding which pertains to the concept of a reference system concurs with the findings of Rivoire⁵ who also found that sex did not have any effect.
2. No significant correlation was found between the socio-economic status of the sample and the development of any of the four concepts.

This finding does not substantiate Vinacke's⁸ claim that socioeconomic status effects concept formation. However, it may be that social class membership is more important in the primary grades and that the effect of this factor may tend to lessen as the child progresses through the grades.

3. There was a significant correlation between chronological age and the development of four concepts. This agrees with the findings of Dodwell⁹ who concluded that an over-all ability to deal with spatial concepts is a function of age. Since the exact nature of this relationship is not explicit, this finding should not be interpreted as meaning that an increase in the development of these concepts will necessarily follow an increase in the subject's chronological age.
4. The intelligence of the sample was found to be significantly related to the development of concepts of a reference system, direction and scale. It was not found to be significantly related to the development of a concept of distance. However, it should be noted that the scores for this subtest were low for all subjects and that there was a lack of internal consistency within the test itself.
5. There was a significant relationship between the subjects' grade level and the development of the four concepts. However, since this developmental increase was linked with chronological age and with one exception intelligence, no one of these factors can be said to explain the increase in its entirety.
6. Four stages in the development of the concept of a reference system utilizing artificial axes were observed. While the characteristics of these stages matched those described by Piaget, the stages in this sample occurred from one to two years later than Piaget found with his subjects.
7. Three stages in the development of a concept of reference system utilizing natural axes were observed. Again these stages and their characteristics were similar to the stages Piaget describes but the ages at which they occurred were found to be as much as two to three years later. This finding and the previous one concur with the findings of Satterly⁶ who also found that the development of a concept of reference systems occurred later than Piaget has claimed.
8. Three stages in the development of the concept of direction were observed. These stages appeared to be related to the subject's ability to use a system of reference points and approximated the logical development of thought processes as outlined by Piaget.
9. Three stages in the development of the concept of scale were observed. They were similar to those described by Piaget, but once again the ages at which the stages occurred were later than the ages Piaget found. This finding supports that of Sorohan⁷ who also found the development of this concept to occur later than Piaget claims.

10. Most subjects found the pattern of markers in the artificial subtest easier to replicate when the cards were parallel rather than rotated. Subjects in grades one and two evidenced little or no awareness of the need to rotate the cards and subjects up to and including the grade five level frequently used mirror images, 90, 180 and 270 degree rotations when attempting to copy the configurations.

Conclusions and Implications

1. Programmes designed to be used in teaching map reading and interpretation to elementary school children should incorporate clear identification of the spatial concepts necessary for the development of these abilities. Furthermore, the authors of such a programme should be cognizant of the level of conceptual development characteristic of the children for whom the programme is intended and strive to match the new concepts in the programme with the cognitive development one might expect from these children.
2. To facilitate conceptual development, and since it is recognized that concept formation is closely related to experience, children should be provided with numerous opportunities to engage in situations structured to develop specific concepts.
3. Educators realize that while a child may normally reach a certain stage of conceptual development for a particular concept at a specified age, it does not follow that his concept could not have been developed earlier. Rather, it is quite possible that the development of certain concepts might be facilitated by special teaching to develop these concepts at a much earlier age.
4. In order to facilitate the development of the concept of a reference system, children beginning in grade one should be given experiences in which they are required to express the location of one point relative to another in terms of some form of a co-ordinate axis system.
5. This study indicates that children appear to have great difficulty in visually estimating small distances. Since this skill is necessary in map reading and interpretation as well as in mathematics, art, music and other subjects, efforts should be made to develop a series of lessons which could be used to enable children to develop this ability more fully.
6. Since a concept of direction is essential in any form of map reading and interpretation, lessons should be designed for use in teaching children how to utilize reference systems to avoid confusing directions.
7. According to the results of this study, children have relatively little awareness of the concept of scale until approximately the ages of ten or eleven. However, it is possible that through teaching, the development of this concept could be hastened. Children should be given

opportunities to work with a variety of real objects of various sizes and scales and helped to discriminate between the scales.

8. The finding that some children visualize certain spatial configurations as reversed or as mirror images and that they are not aware of this alteration in their perceptions has important implications for the fields of reading, writing, art, mathematics, map study and any other field where a child is required to work with spatial configurations. Educators should be aware of the occurrence of this type of behaviour and some form of test should be developed and administered to identify children who experience perceptual difficulties of this nature. Similarly, procedures for overcoming these perceptual errors should be developed to aid children who commit these errors.

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Since the publication of Getzels and Jackson's study of the relationships among creativity, intelligence and achievement many studies have been undertaken. In this article the author reports research which, though not wholly supporting the thesis, provides significant support for the view that measures of divergent thinking add a valuable dimension to achievement prediction. This and other studies carried out during the past ten years point to the need for a well designed longitudinal study to establish reliability and validity for "divergent thinking" tests and demonstrate the worth of the dimension in ability measurement.

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Creativity, Intelligence and Achievement*

Despite considerable disagreement concerning creativity's nature, personality correlates and relationship to conventional intelligence, a large number of studies in recent years including those of Getzels and Jackson,¹ Palm,² Brown,³ Torrance^{4,5,6}, and Cline, Richards and Needham⁷ have reported significant relationships among creativity, IQ and achievement measures. The usual technique employed to demonstrate this interaction among the three variables has been based on the Getzels and Jackson procedure.⁸ These authors selected a "creative" group consisting of children high on creativity but not commensurately high on IQ and, an "intelligent" group consisting of children high on IQ but not commensurately high on creativity. They reported that "the achievement scores of the two groups were equally superior to the achievement scores of the school population as a whole".⁹ Furthermore, this equal superiority of performance was achieved "despite the 23 point difference in IQ between the high creatives and the high IQs".¹⁰ The Getzels-Jackson findings were supported by a series of no less than eight studies conducted by Torrance.¹¹ In six out of the eight, his findings resembled

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those reported by Getzels and Jackson, while the two schools in which the Getzels-Jackson effect was not observed were characterized, according to Torrance, by heavy emphasis on convergent thinking.

However, a series of studies by Yamamoto,^{12,13,14,15} were not unequivocally supportive of the Getzels-Jackson effect. Yamamoto's studies are particularly important because he tried to avoid procedures leading to apparently significant findings which were, in fact, mere methodological and statistical artifacts, grounds on which several authors like Burt¹⁶ and DeMille and Merrifield¹⁷ have criticized the Getzels and Jackson study. It is probably genuinely possible, by the use of appropriate tests, to sample a cognitive dimension of creativity, which "possesses a degree of internal consistency and pervasiveness which is kindred to that possessed by the conventional intelligence dimension".¹⁸ The inter-relationship between creativity and achievement can only be properly understood by studying high creativity, not merely in the absence of high IQ as Getzels and Jackson did, but in its presence as well. Hence, Getzels and Jackson-type studies err in defining highly creative individuals as those high on creativity but not on IQ and highly intelligent individuals as those high in IQ but not creativity. In dealing with only High IQ-Low Creativity (High-Low) and Low IQ-High Creativity (Low-High) groups, such studies overlook two important groups—the group consisting of those children who are high on both qualities (the High-High group) and the group low on both (the Low-Low group). These groups possess characteristic patterns of school achievement and are well worth further study.

If creativity scores are significantly related to achievement and can usefully complement conventional measures of intelligence, it should be possible to discriminate between children of similar IQ on the basis of creativity scores. The achievement of children high on both qualities should surpass those merely high on intelligence (Getzels and Jackson's "intelligent" group), while children low in IQ but high in creativity (Getzels and Jackson's "creative" group) should surpass those low on both qualities. Hence, the present study is concerned with extending the usual kind of creativity-achievement study by including the two groups frequently ignored (the High-High group and the Low-Low group) and comparing the relative academic achievement of all four groups.

Method

Subjects

The subjects consisted of virtually the entire grade seven population of a large Edmonton junior high school. Of 345 children enrolled, 320 completed the entire test battery and findings reported in this paper are based on scores obtained from those 320 children. The subjects included 170 boys for whom the mean verbal IQ was 114.7 (SD = 15.2;

range 79 to 148), while the corresponding figure for the 150 girls was 113.8 (SD = 13.6; range 88 to 150). The mean age of the boys was 13 years 10 months (SD = 16.6 months; range—11 years 1 month to 16 years 1 month) and the girls 13 years 2 months (SD = 17.3 months; range—11 years 7 months to 16 years 1 month).

Tests

Scores were obtained on the appropriate level of the Lorge-Thorn-dike scale, verbal Form A (IQ) and six “divergent thinking” tests.

This group of tests included:

1. Seeing Problems (Devised by Guilford and associates, reported by French, Ekstrom, and Price.¹⁹)
 2. Tin Can Uses (Torrance²⁰)
 3. Consequences (Guilford and associates, reported by French *et al.*)
 4. Symbol Production (Guilford and associates, reported by French *et al.*²²)
 5. Circles (Torrance²³)
 6. Hidden Figures (Guilford and associates, reported by French *et al.*²⁴)
- Finally marks (at the most recent end-of-year exams) on “core courses” including English, Mathematics, Science, and Social Studies were obtained and summed to yield a “academic average” for each child.

Procedure

The tests were all administered to the 320 subjects on the same day, following instruction for administration in the test manuals. Subsequently, the IQ test was also scored according to the manual instructions. However, in view of the doubtful reliability (Wodtke²⁵) and validity (Vernon²⁶) of the “divergent” tests, a different procedure was adopted in scoring them. As Torrance²⁷ has pointed out, this kind of test may be scored for “fluency”, for “flexibility”, for “originality”, or for several other dimensions. For the purposes of the present study, scoring was for originality. This method involves allotting weights for each subject’s responses to each item of each test, the highest weights going to those responses which are least common within the entire sample. Of course, a response must be relevant to the particular test item and not merely bizarre, before it receives any credit at all. Weights are as follows; responses appearing on more than 15% of protocols—0; responses appearing between 7% and 15%—1; responses appearing from 3% to 6%—2; responses appearing 1% or 2%—3; responses appearing less than 1%—4 points. These weight differ from those employed by Torrance and were modified in order to avoid scoring as 0 the large number of responses which appeared on 10% to 15% of protocols. These responses, which would have received no credit in the Torrance weighting system, were argued to be sufficiently unusual

to warrant being taken into account. The data yielded by this procedure are more objectively defined than is usual in studies of creativity, and provide an operational definition of what the present author understands the term to mean.

Although the procedures outlined here are directly based on the work of Torrance and associates, the present approach differs by concentrating on only one dimension of the creativity concept. This difference in approach has important implications for any comparison of findings in the present study with those of Getzels and Jackson, or Torrance. In particular, it means that direct comparisons are not strictly possible. However, this loss of direct comparability is suffered at the gain of objectivity of scoring procedures and of reliability in the data obtained, since Mackler,²⁸ for example, has shown that scoring for originality alone markedly increases the reliability of "divergent" test scores. The deviation from strict adherence to Torrance-type procedures also has an important methodological implication which will be discussed in the following paragraphs.

After test scoring had been completed, a single, composite creativity score was obtained for each subject by summing stanine scores on each "divergent" test, stanines being employed to avoid difficulties associated with large differences in test variances. Subsequently, the total group was divided into high and low subgroups (above and below the median) on both creativity and IQ. Finally, four experimental groups were defined: these four groups comprised those children above the median on both IQ and creativity (the High-High group), those above the median on IQ but below in creativity (the High-Low group), those below the median in IQ but above in creativity (the Low-High group) and those below in both (the Low-Low group).

Basic to the technique of obtaining a composite creativity score by simply summing scores on several different tests, is the assumption that the scores are directly additive, in the sense that the different tests yielding the sub-scores all measure essentially the same single thing. That is, it is assumed that what Meredith calls "a unidimensional latent attribute"²⁹ underlies the different tests, so that they are "homogeneous" in the sense proposed by him. In fact, the usual kind of study investigating the relationship between creativity and achievement (e.g. Yamamoto³⁰), employs tests sampling various of the dimensions postulated by Torrance³¹ (e.g. fluency, flexibility, originality, and so on). Hence, when the tests are summed to yield a total creativity score, admittedly different aspects of the creative processes are mixed in together. Whether this procedure is valid or not is unknown at present.

In the present study, by contrast, difficulties associated with the question of sub-score additivity have been reduced by confining the creativity variables to the single dimension of originality. In this case,

the assumption of additivity is clearly reasonable. Again, however, strict comparability with earlier findings has been lost by scoring for originality only.

Subsequent to the procedures outlined, achievement scores were compared for the four IQ-Creativity groups divided according to sex, using the two-way analysis of variance model suggested by Winer.³²

Results

Mean scores and standard deviations for the 170 boys and the 150 girls on all three variables are shown in Table I.

TABLE I
IQ, CREATIVITY AND ACHIEVEMENT SCORES

Group	N	I.Q.		Creativity		Achievement	
		Mean	S.D.	Mean	S.D.	Mean	S.D.
BOYS							
High-High	58	123.5	7.57	36.2	4.62	69.6	8.50
High-Low	27	125.2	6.17	27.5	2.75	63.5	9.01
Low-High	26	105.3	8.83	35.3	4.85	56.6	9.91
Low-Low	59	100.6	9.27	23.9	4.73	51.9	10.00
GIRLS							
High-High	43	126.4	9.60	35.7	4.91	70.8	80.6
High-Low	32	123.1	7.45	25.5	3.96	63.7	8.17
Low-High	28	105.7	4.70	34.1	2.91	58.7	9.31
Low-Low	47	101.0	6.57	24.4	3.70	51.8	9.64

Results of the analysis of variance are shown in Table II.

TABLE II
SUMMARY ANALYSIS OF VARIANCE FOR IQ-CREATIVITY GROUPS,
SEX AND ACHIEVEMENT

Source	Sum Square	df	Mean Square	F	P
Groups	1345.20	3	448.40	5.26	<.01
Sex	36.16	1	36.16	.42	N.S.
Interaction	108.59	3	36.16	.42	N.S.
Error	26579.28	312	85.19		

The data satisfied the requirement that cell variances be homogeneous ($F = 1.54$, $df = 8$, 58).

Subsequently, in view of the absence of sex differences, corresponding male and female IQ-Creativity groups were combined, and comparisons among individual cell means carried out using the studentized range statistic (q), calculated according to the procedures outlined by Winer.³³ The relevant statistics are shown in Table III.

TABLE III
STUDENTIZED RANGE STATISTICS (Q) FOR MEAN DIFFERENCES
IN ACHIEVEMENT

Statistic	High-High v High-Low	High-High v Low-High	High-High v Low-Low	High-Low v Low-High	High-Low v Low-Low	Low-High v Low-Low
q	2.95	5.42	8.18	2.64	5.23	5.59
p	< .50	< .01	< .01	< .50	< .01	< .05

Discussion

A useful way to look at these results is to examine the mean differences for each pair of groups, considering the extent to which differences obtained in each case are consistent with the hypothesis that creativity is strongly related to academic achievement. This can be done effectively by adopting the highly convergent view that IQ tells us all we need to know about intellect and attempting to maintain it in the face of the present data. The significant differences between the High-High group and the Low-Low ($q = 8.18$; $p < .01$) are entirely predictable on the basis of IQ alone so that, strictly speaking, the concept of creativity is not needed to account for them. Of course, they are also predictable on the basis of creativity alone, so that it could be argued that the concept of IQ is not needed at all. However, interpretation of results in the way most favourable to IQ and least favourable to creativity, lends strength to any positive findings. The High-High group also surpassed the Low-High group ($q = 5.42$, $p < .01$) but, again, the concept of creativity is not needed to account for these differences. In fact, the difference between the High-High group and the Low-High group is not predictable on the basis of creativity scores, since both groups are high on that variable.

The remaining findings, however, definitely suggest that creativity scores are useful in discriminating between high and low achievers, by permitting predictions not possible on the basis of IQ alone. Comparison of the High-High group with the other high IQ group (the High-Low group) is especially revealing, since both these groups were above the median in IQ, although on opposite sides of it as far as creativity was concerned. Hence, if creativity is closely related to achievement, the High-High group should differ in achievement from the High-Low group, despite the absence of IQ differences. In fact, large differences in achievement were observed ($q = 2.95$, $p < .05$). Similarly, the Low-High group should surpass the Low-Low group and again mean achievement scores were, in fact, significantly different ($q = 2.58$, $p < .05$).

Hence, these findings support the hypothesis that the kinds of tests often described as measuring "creativity" are usefully related to academic

achievement, despite the fact that, strictly speaking, their predictive validity is unknown and will remain so until a long-range study of the Terman type³⁴ is carried out. The data reported here suggest that, when creativity test data are taken into account, finer discriminations between students are possible than those yielded by IQ scores alone. This point has implications for the concept of "over-achievement" and supports those authors who have argued that "underestimation" more meaningfully describes the phenomena usually accounted for by the use of the former term.

Of course, bearing in mind the significant correlations between creativity and IQ measures reported in other studies and summarized elsewhere by the present author,³⁵ this may all mean little more than that taking repeated measures of the independent variable (intellect) permits better sorting out in terms of the dependent variable (achievement). Hence, the relatively weak relationship between creativity scores and achievement may be interpreted by some educators as indicating the relative unimportance of creativity tests in comparison with more conventional measures. On the other hand, it might also be seen by some as evidence of the extent to which our schools are dominated by emphasis on convergent processes.

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The California Psychological Inventory (C.P.I.) was administered to 377 Canadian ninth grade students who had been divided into three achievement categories (Failures, Mediocres, and Honours) on the basis of a Provincial academic examination. A formula developed by Gough (1964) which utilized six weighted C.P.I. variables significantly differentiated between the three achievement groups. A chi-square also indicated that these three achievement levels were related to various indices of social class. The relationship between the meaning of the C.P.I. variables and the indices of social class was discussed.

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The C.P.I. As A Predictor of Academic Success

A number of psychological studies have utilized the California Psychological Inventory (C.P.I.) as an effective measuring device for the study of personality factors involved in academic achievement. In one such approach, Snider and Linton¹ administered the C.P.I. to 47 high achieving and 47 low achieving high school students. The results showed that five out of the total 18 variables on the C.P.I., including responsibility (Re), self-control (Sc), good impression (Gi), achievement via conformity (Ac), and intellectual efficiency (Ie), significantly differentiate between the two groups. Pierce² also compared high and low achieving high school students and found that five of the fourteen scales he used significantly differentiated between the groups. Only three of the five (Re, Ac, and Ie), however, were synonymous with those of Linton and Snider. Keimowitz and Ansbacher³ likewise found thirteen of the C.P.I. scales to differentiate significantly between over-achievers and under-achievers in mathematics. In another more comprehensive study, Lessinger and Martin⁴ found the C.P.I. able to significantly differentiate between gifted and average junior high school students.

The most comprehensive and statistically valid study, in terms of large scale sampling, using the C.P.I. as a predictor of student achievement, was carried out by Gough.⁵ In this study 571 males and 813 females in the original sample, and 649 males and 722 females in a subsequent cross validation study, were tested. Utilizing a multiple regression technique, Gough constructed four equations, all of which produced a "predicted grade point average" in the form of a T-score. The validity coefficient for these four equations ranged from .55 for the three using only the C.P.I. variables, to .68 when the I.Q. was weighted also. These coefficients are impressive when one considers that rarely do personality test variables correlate above .40 with any objective indicator of behaviour.

The foregoing studies indicate that a large number of personality factors are involved in academic achievement. Furthermore, these personality factors do not necessarily correspond to the standard concepts of basic ability and intelligence. Obviously, attitudes and secondary needs, both of which are culturally determined, play a large part in academic success. The purpose of the present study was to determine empirically whether these findings also hold for a Canadian high school population.

Method

As part of a larger Canadian study, the C.P.I. was administered to three groups of ninth grade students. Each year in the province all public school students in ninth grade take Provincial Examinations administered by the school and the Department of Education which determine their placement in different academic patterns in the tenth grade. These examinations are very important to the child for the individual standing on the test is a key factor in his subsequent placement and career in the Provincial public schools. After all the ninth grade students have taken these examinations, their aggregate scores are divided into stanines. Approximately the first two stanines make up the honours group, the middle six are designated mediocres (pass), and the lower two groups are failed. The honours group is permitted to go to university. The mediocre go into a clerical or lesser academic area, such as technical or skilled crafts. Individuals in the failure group frequently drop out and enter the lesser trades available within the Province.

For the present study, all of the honours and failures, and a random sample of the mediocres, were given the C.P.I. Extraneous factors such as apathy and ruined test blanks lowered the effective sample of the three groups, rendering in all 124 honours, 164 mediocres and 89 failures for a total of 377 usable C.P.I. scores. After individual C.P.I. scores had been derived, they were classified into their respective categories of either honours, mediocres, or failures as determined by the Provincial examinations.

It was decided that the most efficient method of using the C.P.I. to predict academic achievement or failure was to use one of the formulae for predicting GPAs (Grade Point Averages), which were originally reported by Gough. The formula made use of only six C.P.I. variables, including responsibility (Re), Socialization (So), good impression (Gi), achievement via conformity (Ac), achievement via independence (Ai), and intellectual efficiency (Ie), and is stated: $G.P.A. = 20.116 + .317Re + .192So - .309Gi + .227Ai + .244Ie$. Therefore, the makeup of a high GPA would include a positive amount of all avariables in the formula except Gi. A thorough explanation of the meaning of these variables has been given elsewhere.⁶

Statistical Analysis

A three-way single classification analysis of variance comparing the three main groups was programmed for a 1401 IBM computer and the theoretical G.P.A.s for each subject were punched into cards and analyzed by this procedure. Subsequently, a Newman-Keuls Test on All Ordered Pairs of Means was performed to test the respective differences between the means of each main group. This test is analogous to performing three separate *t*-tests between the three means but has the advantage of being a more sensitive measure since it does not allow the probability of chance significance to become greater with each successive comparison.⁷ Figure I shows mean profiles of the three groups. Note that with only one exception, socialization, the groups are ordered in the predicted manner. The analysis of variance comparing the theoretical G.P.A.s of the three groups showed a significant overall difference between the groups ($F_{2,374} = 103.7$; $p < .001$) and the Newman-Keuls Test indicated that all three means were significantly different from one another ($q = 2.48, 7.16, \text{ and } 4.67$; $p < .01$).⁸ It was therefore concluded that the C.P.I. significantly distinguished between the mean levels of academic achievement in this Canadian sample.

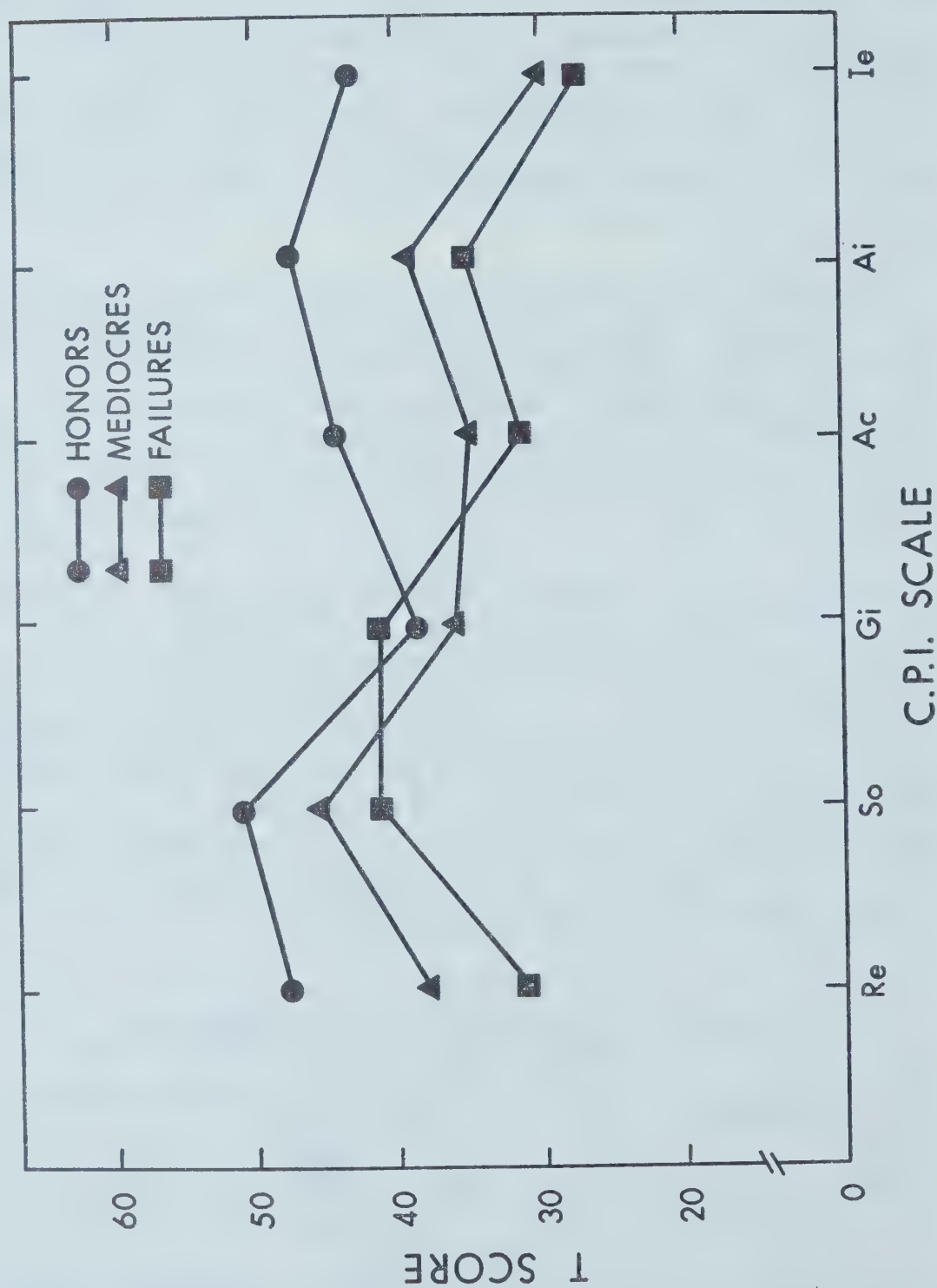
TABLE I
ANALYSIS OF VARIANCE TEST COMPARING THE
THREE MAIAN GROUPS

SOURCE	df	ss	F	P
B/Groups	2	3,327.40	103.7	<.001
W/Groups	374	6,038.49		

Discussion

It is apparent that the C.P.I. is able to significantly differentiate between junior high school achievement levels. For counselling purposes, instruments of this type may be a useful adjunct in the understanding of academic achievement and the personality correlates which are involved with the different levels of achievement. While the C.P.I.

FIG. 1—Graphical Representation of the Differentiation of Achievement Categories by C.P.I. Scores.



has been extensively used on American students, studies have not been done on a large scale on Canadian high school students.

On a surface basis it would further appear that specific personality characteristics may be associated with various levels of academic achievement. These personality factors may then be viewed as forming patterns that may be termed low achievement and high achievement academic styles. Utilizing this approach, the counsellor could administer tests like the C.P.I. as a screening device for success and failure personality patterns in the school. He could then proceed through counselling services to assist those with low achievement personality patterns.

However, while this clinical involvement has its merits for particular students, it tends to ignore the basics of low achievement as a large scale social phenomenon. It has been shown in several studies that high academic achievement in high school is closely related to particular personality styles which are characteristic of specific social class and ethnic life styles.

In the present research it was found that the three achievement categories (i.e., Failures, Mediocres, and Honours) correlated with the comparable social class levels. (See Table II) There was a direct linear relationship between the social class background of the students and their achievement levels on the Departmental examinations. Hence, the C.P.I. predictions of academic success or failure reflect social rather than psychological variables. One could just as well predict academic success with large numbers of students utilizing social status and ethnic variables.

TABLE II
RELATIONSHIP BETWEEN STUDENT ACADEMIC PERFORMANCE AND
CERTAIN PARENTAL SOCIAL CLASS CHARACTERISTICS

Independent Variable	χ^2	d.f.	P
Father's Occupation (professional v. clerical)	84.53*	4	< .001
Joint Parent Income (in \$1,000's) (< \$6 v. \$6-11 v. > \$12)	33.11*	4	< .001
Father's Education (< high school completed v. high school completed v. university)	88.85*	4	< .001

An analysis of the six C.P.I. variables involved in the prediction of academic achievement makes clear the personality pattern which is measured by the formula. Five of the variables, namely responsibility (Re), socialization (So), achievement via conformity (Ac), achievement via independence (AI), and intellectual efficiency (Ie) are obviously factors which are related to higher achievement in an academic setting. They are also personality qualities which are more commonly present in middle and upper class children, and in children from those ethnic groups that value those traits regardless of their socio-economic status.

The sixth variable, namely good impression (Gi) is the exception in the above discussion. It is easier to make a good impression regardless of class or ethnic origin than it is to utilize one's intellectual energies in a structured academic sense and to internalize emotional controls. Hence, the loading on the (Gi) variable does not clearly involve either low or high achievement prediction.

Implications for School Programs

If school success is a function of personality factors which produce a high or low achievement pattern, it is requisite that the schools consider alternative curricula and teaching styles. Further, if the low achievement syndrome has its origin predominantly in low status social groups, or in specific ethnic groups, it would be appropriate to design prescriptive school programs that effectively counter the values and motives endemic to these parental groups. This would be in sharp contrast to the current American and Canadian approach of expecting most pupils to adjust to relatively uniform school programmes. The traditional and current school programmes apply a simple standard to vastly divergent student populations. Schools need to become far more conscious of diagnostic and prescriptive skills in the development of school programmes, and far less concerned with artificial academic requirements that benefit those in the establishment, and deprive the disadvantaged of educational opportunity.

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- ² J. V. Pierce, "Personality and achievement among able high school boys". *Journal of Individual Psychology*, 1961, 17, pp. 102-107.
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- ⁶ H. G. Gough, *Manual for the California Psychological Inventory*, (Palo Alto, California: Consulting Psychologists Press, Inc., 1956).
- ⁷ B. J. Winer, *Statistical Principles in Experimental Design*, (New York: McGraw-Hill, 1962), pp. 80-85.
- ⁸ The Newman-Keuls test utilizes the *q* statistic which can be equated with the *t* statistic. Tables giving the critical values of this statistic can be found in *The Probability Integrals of the Range and of the Studentized Range*, prepared by H. Leon Harter, Donald S. Clemm, and Eugene H. Guthrie (Table 11.1) published in WADC Tech. Rep. 58-484, Volume 2, 1959. Wright Air Development Center.

The pressure for religious instruction in public schools is undoubtedly stronger in Alberta than in most parts of the world. Frequent requests and pleas for more opportunity are made by individuals and groups. In this article, the author reports the results of a systematically organized survey which reveal that only a minority of school systems avail themselves of the provisions of the School Act.

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Religious Institutions in "Alberta's Public Schools"

The religious education in the school controversy has experienced varying degrees of intensity in the course of Alberta's history, but at no time has it been resolved. Most frequently the controversy is conducted outside a situational context and therefore becomes rather insubstantial. The contestants rarely ask themselves what legal and institutional arrangements for religious instruction in the schools exists and what use is being made of these. This paper reviews these provisions and reports on the use being made of them.

The investigation was prompted by the evidence of a continuing concern in this area as illustrated by two recent examples. One of these was the presentation of a brief to the Alberta Cabinet by the Alberta Veterinary Medical Association in support of a resolution passed by this association. The resolution reads: "Be it resolved that the members of the Alberta Veterinary Medical Association respectfully recommend to the Government of Alberta that courses in Ethics and Morals be taught in the schools in Alberta from Grades VII to XII inclusive." What the association has in mind becomes clear when one reads in the brief the following:

"The ethics and morals on which this nation was founded, and we trust, by which it will continue to be governed, are based on the great religions and philosophies. The teaching, of such a course as we advocate, could centre around knowledge of the great religions and philosophical truth, how these truths have been tested in the crucible of history could be revealed by teaching the complete story of mankind from the earliest recorded times to

the present. The way the observation or denial of these truths affected the rise and fall of nations and civilizations could be underscored. The fact that, over thousands of years, all the destructive forces of history have not been able to shake the central moral theme of the great teachers should assure our young people that the theme is not only true, but comes from a higher authority than man himself."¹

The other example is the results of a recent poll of elementary school teachers and principals by the Calgary Public School Board on the provision for religious instruction in its schools.² These results have received a good deal of radio and press notice even though it was merely a part of the process of reviewing all Board policies. Most of the Calgary teachers concerned favoured eliminating the religious instruction provided for in section 391 of the Alberta School Act. More will be said of this later.

The provisions for religious instruction in Alberta's schools include, apart from curriculum content, provision for the establishment of "private" schools, the possibility of establishing "separate" schools, and legislation governing the operation of "public" schools. The users of the privilege/right of establishing a private school must, of course, support their school independently of public funds. The "separate" school is publicly supported but bound by the same regulations as govern the "public" school. The special position of the "separate" school lies in the homogeneity of outlook it generally recognizes and serves.

The regulations governing religious instruction are found in sections, 390-394 of the Alberta School Act.³ The first of these deals with school opening religious observances involving scripture reading and recitation of the Lord's Prayer. The second provides for one half hour of religious instruction each day. The third concerns the right to nominate teachers for religious instruction. The fourth grants a student the right to withdraw from religious instruction conducted during the half hour period. The fifth is concerned with protecting the students educational opportunities where he does not take part in religious instruction.

The use being made of these provisions has been the subject of a study which showed that relatively little use has been made of the time provided for religious instruction by the School Act, under section 391. The employment of the provisions that was being made was much more frequent in the area north of Westaskin than south of this point. In general, however, the instruction was geographically spotty. Although the information gathered proved to be not amenable to statistical analysis use was most common and most intensive in areas with a predominately French Canadian Roman Catholic population. Analysis of the findings showed, however, that general law cannot be appealed to for explanation for any particular condition. It would seem that particular circumstances such as the presence of a particular individual or of a particular segment of an ethnic or a religious group is largely responsible for initiating the instruction.

The study was limited to Alberta “public” schools operating outside Calgary and Edmonton. The Edmonton Public School Board has passed no resolution for religious instruction in the formal sense. The Calgary Public School Board has passed a resolution requiring one half hour of religious instruction each week for grades I to VI inclusive. This is conducted by the classroom teacher using a series of books entitled “*Teachers’ Guide to Religious Education*” published by Ryerson Press, Toronto. It was on this provision and the one governing school opening observances that the elementary teachers and principals were recently polled. It is reported that 75 per cent favoured discontinuing the half hour of instruction and only 75.7 per cent favoured retention of the opening observances. Lack of competence and the view that such instruction should not be part of the teacher’s responsibility were given as two of the reasons for favouring discontinuance of the half hour of instruction. It should be noted that although having teachers give religious instruction in “private” and “separate” schools is quite common, it is uncommon in “public” schools, except in “public” schools serving wholly or mainly French Canadian Roman Catholic students. Usually the clergy of the interested denominations conduct the classes. The study was conducted by means of a questionnaire circulated to superintendents of schools, principals and teachers, as the particular circumstances dictated. The following are some of the findings and are based on 100 per cent returns.

It was found that religious instruction under section 391 of the School Act was offered in only 18.5 per cent of the operating schools included in the study. In general either one or five periods were used in these schools (See Table I). Fewer senior high school grades than elementary and junior high school grades were involved, (See Table II). And, somewhat suprisingly, it was found that fewer senior high school grades were included where one period per week was devoted to this instruction than where five periods per week were used. In schools offering such instruction 36 per cent of the senior high schools gave it for five periods per week as compared with 16.7 per cent for one period. Such a relationship did not hold for the junior high school.

TABLE I
PERCENTAGES OF SCHOOLS OFFERING RELIGIOUS INSTRUCTION UNDER
SECTION 391 OF THE ALBERTA SCHOOL ACT ACCORDING TO THE NUMBER
OF PERIODS USED

Periods	Percentage
One Period Each Week	54.8
Two Periods Each Week	5.5
Three Periods Each Week	7.6
Four Periods Each Week	.1
Five Periods Each Week	32.0

TABLE II
PERCENTAGES OF SCHOOLS OFFERING RELIGIOUS INSTRUCTION
ACCORDING TO FOUR GRADE DIVISIONS

Grade Range	Percentage
1 to 3	79.7
4 to 6	89.5
7 to 9	72.7
10 to 12	25.1

Roman Catholics availed themselves of the provisions for this instruction in many more schools than did other denominations. The United Church and the Anglican Church were offering instruction in an equal number of schools. Of the numerically small denominations, the Pentacostal Church, the Church of Latter-Day Saints and the Mennonite Church showed a good deal of interest in using the provision for the half hour of instruction. The data relating to each denomination is presented in Table III.

TABLE III
USE OF PROVISIONS FOR RELIGIOUS INSTRUCTION IN RELATION TO
DENOMINATIONAL STRENGTH*

Religious Denomination	Percentage of Denominations in Alberta	Denominations Outside of Calgary and Edmonton	Percentage of Schools in which Denominations Offer Religious Instruction**
Anglican	11.8	48.10	22.0
Baptist	3.2	49.80	4.9
Greek Orthodox	3.6	63.30	4.0
Jewish	0.5	13.80	0.0
Lutheran	9.2	62.70	8.3
Mennonite	1.2	90.70	4.2
Pentacostal	1.1	61.10	6.3
Presbyterian	4.1	55.00	4.2
Roman Catholic	22.4	59.90	67.0
Greek Catholic	2.6	66.20	5.6
United Church	31.5	55.50	22.0
Others ***	8.8	64.10	32.1

*All figures relating to demoninational and ethnic groups are taken from the 1961 Federal Census of Canada.

**Because more than one denomination may use one school this column need not add up to 100 per cent.

***About 10 per cent of these were designed simply as Protestant or non-denominational which would increase the participation of some or all of the Protestant demoninations specified. "Others" include the Church of the Latter-Day Saints who gave instruction in nearly 5.6 per cent of the schools offering instruction.

The study indicated that a large percentage of the teachers in grades 1, 2 and 3 do open the morning classes with the recitation of the Lord's Prayer and/or scripture reading. The questionnaire asked the approximate percentage of teachers who open the school day with the recitation of the Lord's Prayer and/or scripture reading and the reporting form

provided checking spaces for intervals from 0 per cent to 91-100 per cent for four grade ranges—1-3, 4-6, 7-9, 10-12. Of the reports, 75 per cent checked 91-100 per cent for grades 1-3. The figure dropped to 58 per cent for grades 4-6, to 30 per cent for grades 7-9 and to 13 per cent for grades 10-12.

TABLE IV
APPROXIMATE PERCENTAGE OF TEACHERS OPENING THE SCHOOL DAY
WITH THE RECITATION OF THE LORD'S PRAYER AND/OR SCRIPTURE
READING BY GRADE LEVEL

Percentage of Teachers Opening School with the Lord's Prayer or Scripture Reading or Both	Percentage of Reports According to Grade Range			
	Grades 1-3	Grades 4-6	Grades 7-9	Grades 10-12
41-100	75	58	30	13
81-90	13	23	14	3
71-80	7	7	14	6
61-70	4	6	7	9
1-10	0	0	6	29
0	0	0	4	10

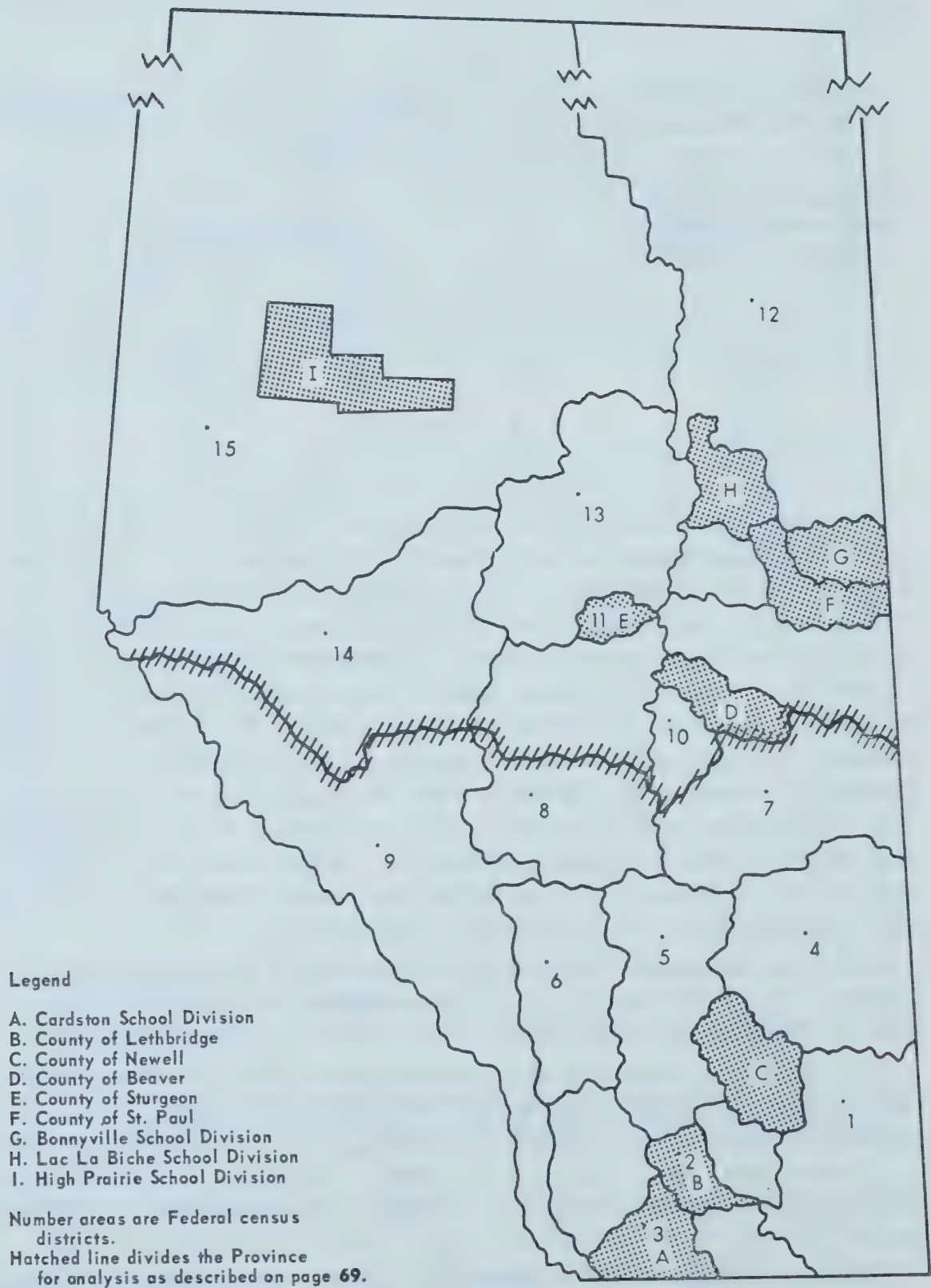
For purposes of analysis the Province was divided roughly along the 12th base line or through a point about eight miles south of Wetaskiwin.⁴ Although about 72 per cent of the Province's total area lies to the north of this line it does roughly divide the Province in a number of ways. About half the total population resides on each side of this line. It equally divides the number of operating "public" schools and the "public" school enrolment, (Calgary and Edmonton excluded). There are an equal number of large administrative school units (counties and school divisions) on each side. There is about an equal number of "separate" schools and about equal 'separate' school enrolments on each side of this line (Calgary and Edmonton excluded). To the north of this line 54 per cent of the schools included in the study were classified as "centralized"⁵ as compared with 58 per cent to the south.

Using this geographic division of the province it was found that of the 18.5 per cent of Alberta schools offering religious instruction 14 per cent were in the northern area and only 4.5 per cent in the southern area.

In the census districts (Fig. I) north of the dividing line the percentage of schools offering religious instruction under section 391 was the highest in district No. 12 with 52.5 per cent, which was followed by No. 15 (34 per cent) and No. 11 (19 per cent). In the south the order was district No. 3 (19 per cent), No. 2 (18.5 per cent) and No. 5 (12.5 per cent).

Not only did the larger number of the schools in the northern portion offer religious instruction under section 391 but the instruction generally was given in more grade levels for more periods per week than was

FIGURE 1



reported for the south. In terms of the total number of senior high school grades involved in religious instruction 83 per cent were located in the north. Also of the schools offering religious instruction for the full five periods each week, 89 per cent were located in the north. Of the small number of the Province's schools that offered religious instruction in the south (4.5 per cent) only 14 per cent devoted five periods per week to this instruction.

Turning to specific school administrative units, in only one southern unit was there a substantial percentage of its operating schools making use of the half hour provision. In census district No. 3 the Cardston School Division offered religious instruction in 40 per cent of its schools and in 75 per cent of these schools five periods per week were devoted to such instruction. In census district No. 2 the County of Lethbridge and the County of Newell offered religious instruction in 41 per cent and 36 per cent of their schools respectively. The instruction was concentrated in the elementary school grades and limited to one period per week. In census district No. 5 there were a few schools offering religious instruction in three of the five administrative units it included.

In the north in census district No. 10, the County of Beaver offered the half hour of instruction in 83 per cent of its schools. However, only one period per week was authorized for this purpose in grades 1 to 9. In census district No. 12 the County of St. Paul offered religious instruction in about 73 per cent of its schools for five periods per week and to all grade levels. The Lac La Biche School Division offered this instruction in 50 per cent of its schools. In half of the schools offering the instruction five periods per week were used and in half all grade levels were included for instruction. In the Bonnyville School Division religious instruction was given in 40 per cent of its schools for five periods per week. In half of the schools giving this instruction the senior high school grades are included. In census district No. 11 the County of Sturgeon offers religious instruction in just over 58 per cent of its schools for five periods per week, and in 28.5 per cent of these the senior high school grades were included. In census district No. 15 the High Prairie School Division offered religious instruction in 50 per cent of its schools for five periods per week and included the senior high school grades in half of these.

On reviewing the actual situation as far as use is concerned it would appear that the present provisions are quite liberal enough, to accommodate the wishes of most communities in this matter. A large number of people, members of the clergy among them, consider the matter of religious instruction to be the responsibility of the home and the church rather than that of the school. Those who consider that a lack of attention to religion in the school deprives a child of an important part of his or historical heritage will likely find their solution through curriculum

policies rather than through greater use of school time for religious instruction in a theology, which is the most common manner in which the provision for instruction is used. It is doubtful, however, if curriculum recommendations such as that the Alberta Veterinary Medical Association seems to be proposing would solve the problem they have in mind. The school already teaches ethical standards such as honesty, justice and other prized modes of conduct without a theological base. To attach a theological base would cause grave concern among large numbers of parents who would see in it a denial of religious freedom when offered by the "public" schools. The writer is satisfied that there is serious religious illiteracy because of parental neglect or misguidance. He suggests that one way of reducing this illiteracy and therefore cultural deprivation, would be through the writing and authorization of books that are cultural histories of the events concerning the religious history of the world. However, he is not very optimistic that there would ever be agreement on the selection of such books in a pluralistic society.

REFERENCES

- ¹ Alberta Veterinary Medical Association, A brief submitted to the Alberta Cabinet, October 12, 1966.
- ² *Edmonton Journal*, January 19, 1967.
- ³ See appendix for the wording of the sections.
- ⁴ See Figure I. This dividing line is formed by the southern borders of the County of Leduc, the County of Wetaskwin, the County of Camrose, the County of Beaver and the Wainwright School Division.
- ⁵ A school was designated as "centralized" if it was reported as an eight or more room school.

APPENDIX

Extracts from the Alberta School Act Religious Instruction

390 (1) All schools shall be opened by the reading, without explanation or comment, of a passage of scripture to be selected from those prescribed or approved for that purpose by the Minister, followed by the recitation of the Lord's Prayer.

(2) Notwithstanding subsection (1), a board, by resolution, may dispense with the scripture reading or the recitation of the Lord's Prayer or both, [1962, c.80, s.387]

391 (1) No religious instruction shall be permitted in a school from the opening of the school until one-half hour previous to its closing in the afternoon, after which time any such instruction permitted or required by resolution of the board may be given.

(2) Notwithstanding subsection (1), in a high school providing departmentalized instruction religious instruction may be given to each class for a period not exceeding one-half hour per day, at such time or times as may be approved by the board and the inspector of high schools. [1962, c.80, s.388]

392 (1) In a divisional district, the powers vested in the board under sections 390 and 391 shall be exercised by the board of the district and not by the board of the division.

(2) If the board of a divisional district that passes a resolution under section 391 providing for religious instruction nominates a teacher and transmits the nomination to the board of the division not later than the first day of August, the board of the division shall appoint the teacher nominated by the board of the district to the school of that district if that teacher enters into a contract. [1952, c.80, s.389]

393 A child may leave the school room at the time at which religious instruction is commenced or may remain without taking part in the religious instruction given if the parents or guardians so desire. [1952, c.80, 390]

394 (1) No teacher, school trustee, inspector or superintendent, shall attempt in any way to deprive a child who attends a school in which religious instruction is given and who does not take part in that instruction, of any advantage that he or she might derive from the ordinary education given in the school.

(2) Any such attempt on the part of any teacher, trustee, inspector or superintendent, shall be held to be a disqualification for and voidance of the position or office held by him. [1952, c.80, s.391]

BOOK REVIEWS

SPECIAL EDUCATION IN ENGLAND AND WALES

By Stephen Jackson, (London: Oxford University Press, 1960).

Newcomers to the field of Special Education will find in this slim volume a concise, informative account of educational provisions for handicapped children in England and Wales. With this work, Stephen Jackson, Head of the Special Education Department, Manchester College of Education, attempts to provide an uncomplicated introduction to the complex needs of, and rapidly developing school services and programs for, children with disabilities of mind and body. His overview is substantially successful. Jackson's book makes us aware, among its other merits, that significant developments in Special Education are not exclusively North American.

The organization of the text is simple, direct and useful. The author describes each of the ten categories of handicapped children defined under the *1944 Education Act* and pursuant regulations. His selected case-studies of real-life youngsters illustrate to good effect and give some flesh and blood to the categorizations. Jackson discusses various types of educational provisions for meeting the exceptional needs of the handicapped, including day and residential special schools, special classrooms in regular schools, home tuition, hospital teaching and remedial services. One chapter is devoted to children unsuitable for education in schools as presently constituted. Another, in which the author speaks with the authority of experience, deals with preparatory programs for teachers in Special Education. The final chapter stresses the importance of voluntary organizations, both lay and professional, in the improvement of educational and related services for children with physical, emotional and social disabilities.

Certain legal enactments described by Jackson should raise critical questions of comparison in the minds of his North American readers. For example, the *Education Act of 1944* and related regulations require local education authorities to provide education for educable, handicapped children. Furthermore, the local authorities are enjoined to extend treatment and education for such children both below and above the usual beginning and leaving ages for school. Although placement decisions are usually the result of consultation and agreement, school authorities are empowered to require parents to send their handicapped children to special schools.

Similarly under the *National Health Service Act, 1946* and the *Mental Health Act, 1959* it is the duty of local health authorities to provide training centres for the mentally retarded who have been classified as "unsuitable" for education at school. Parents of these children may be required to send them to training centres.

The legal provisions for assisting the handicapped extend beyond formal training and education. On leaving school handicapped persons may be registered for help under the *Disabled Persons (Employment) Acts*. Under this legislation an employer with twenty or more employees is required to provide work for a certain percentage (currently three percent) of disabled workers.

Such legal provisions appear to offer possibilities for linking and integrating health, educational and employment measures. Integration of this kind has been achieved but little on this continent, particularly in Canada. The system outlined by Jackson is worthy of careful study, if not emulation.

During the past fifteen years, the rapid development of Special Education in England and Wales has been accompanied by an equally remarkable growth in specialized programmes of preparation for teachers of handicapped children. The author reports that in 1950 only two full-time courses were available. By 1965, colleges of education and universities in most of the larger cities and in some smaller centres were offering a total of thirty-four full-time courses. Preparation of teachers of the educationally subnormal has received most emphasis, but special programmes for teachers in other fields of handicap are developing apace. Typically, specialization is provided in one-year courses following three years of basic general teacher education. Successful completion of a one-year programme leads to a certificate or diploma indicating specialization in a given field.

An outline of the content of a one-year course, presumably drawn from a offering of Manchester College of Education, should be of interest to teacher educators. The programmes consists of three terms, covering ten months of intensive theoretical and practical studies. Granted that ten months is a short time for specialization in working with the complexities of handicapped children, one is inclined to think that, if the students in Special Education swallow and digest more than half of the prescriptions and requirements, they will have received a degree of formal preparation far superior to that held by the majority of teachers of exceptional children in this country.

The financial inducements for teachers to undertake specialized training and to remain in special education, as reported by Jackson, are considerable. Teachers employed by local education authorities are eligible for secondment to special courses of preparation on full salary. The seconded teachers receive free tuition, travelling grants and have their absence during training counted for salary purposes. Additional increments to current salary schedules are paid to teachers of handicapped children.

Concrete forms of encouragement along these generous lines might well help local school boards in our country solve some of the critical staffing problems, which grow increasingly acute. We in the Canadian provinces have yet to be convinced that excellence in our special

education programmes depends not as much on fine physical facilities as on first-rate professional staff.

Any reviewer who comes equipped with a few personal biases will not be at a loss for criticisms of this book. The gifted are dealt with not at all. Little is made of that keystone of special education, which is to say, interdisciplinary teamwork. The reader will search in vain for some evidence of the exciting research studies on many fronts which are highly significant for special educators. Nor will the consumer of the work capture the spirit of challenge of a field where answers are few and questions are numerous. In brief, one wished that the author, who most certainly knows it to be so, would speak warmly and eagerly of the rewards that come to first-class professionals who care about children with exceptional problems.

And yet these objections are largely invalid. At the outset, Stephen Jackson explains that he is limiting his discourse to a non-technical introduction to a complex field. His purpose is essentially to conduct a survey of the nature and needs of handicapped children. This he states is to be accompanied by a brief examination of the school services available (and not available) to them. He has done these things competently, clearly and readably. Furthermore, his objectives have been achieved with neatness and economy.

Jackson's book deserves to be read by anyone who is interested in exceptional children.

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PHILOSOPHY AND EDUCATION

By Isreal Scheffler, (Boston: Allyn and Bacon, Inc., 2nd Edition, 1966)

Probably the most important achievement of the 1958 and 1966 editions of Professor Scheffler's *Philosophy and Education* lies in their bringing together a collection of essays which illustrate what can be done when the methods of analytical philosophy are applied to the field of educational theory. In the introduction to the first edition (reprinted in the second) the basic significance of philosophical activity was declared to be "rational reflection, critical analysis of arguments and assumptions, systematic clarification of fundamental ideas," and this perspective has probably governed the selection of the papers included in the second edition as well.

There has however, been a gain in the exemplification of these approaches for in this edition the essays included seem much more germane to the theme of education than were some of the selections offered in the earlier edition. In fact the first three of the second edition's

six sections are given over to the elucidation of "education" as a science, an art, a discipline and a model or rule-guided enterprise. These are followed by a repeat of two selections from Gilbert Ryle's seminal book *The Concept of Mind* and the new edition concludes with two sections (containing eight of its seventeen papers) on the themes of Moral Education and Education, Religion and Politics.

In the editor's own estimation "the idea of a fusion of philosophical method and approach with educational concerns has, at any rate, gained an initial foothold" and, one may agree with him, new ground must therefore be staked out. This is done and as Dr. Scheffler puts it, "the theme of moral education now provides a unifying thread running through the book." Somehow, however, this does not quite harmonize with the prefatory claim carried over from the first edition to the effect that "there are no experts in moral sensitivity, wisdom and ethical judgment." The pieces selected from the writings of W. K. Frankena (*Toward a Philosophy of Moral Education and Public Education and the Good Life*), R. S. Peters (*Reason and Habit: The Paradox of Moral Education and Moral Education and the Psychology of Character*), Morton White (*Religion and the Higher Learning*) and Micheal Oakeshott (*Political Education*) are, despite some analytical content, all basically assertory in nature, advocating this, that, or the other practice in the field of Moral Education, Religion and Politics, while the selection by Dr. Weisberg (*Tradition and the Traditionalist*) is engaged in knocking a particular use of the authority of Tradition. If these writers have no expertese in what they are professing then they could as readily be replaced by other special pleaders. The question arises therefore: on what grounds are their opinions rather than contrary ones offered for our consideration? Or, put somewhat differently, why is there no Scholastic, Marxist or Existentialist among the contributors? It is not that the reviewer necessarily agrees or disagrees with any thing that the writers have predicated; it is just that their inclusion seems rather arbitrary and there is no explanation as to what makes their axiological preferences particularly philosophical or educational.

There is, in this connection, another difficulty inherent in the production of an anthology of which the editor's orientation is methodological and analytical and some of his contributors are affirmatory or negatory with respect to certain of the policy proposals that they are discussing. Thus, Dr. White offers us the conception of the divinity school attached to a large secular university as the proper institution where confirmed supporters of a given denominational position should be able to study and propagate their particular religious affirmation, while the secular university must limit itself to teaching objectively about religion. Is it relevant for a reviewer to agree or disagree with the substantive contents of this proposal when this position appears in the anthology of another man whose public writings have not included a treatment of Dr. White's theme or position? By the fact that the essay has been printed in both editions, one might suppose that there is a certain amount of interjectional support—in Carnap's sense—on Dr. Scheffler's part for the ideas

being put forth; but if one can't hold an editor responsible for the hortatory claims within the items that he has selected, to whom then does one address one's comments?

The appearance of a second edition of a book with the very inclusive title of *Philosophy and Education* also carries the possibility that six or eight years hence there will be a third edition and thus what strikes this reviewer as structural flaw in the organization of the book might very well be corrected at that time. In the preface appended to both editions it is stated that the essays that follow will illuminate certain methods of philosophical analysis. These are variously labelled as (1) the structural method, (2) the method of rational reconstruction, (3) the contextual method of clarification of specific concepts, (4) the sematic method(s) and (5) the explicative method(s). Now these terms, without considerable specification are open to many interpretations and having played the game, with only partial success, of trying to identify the essays in each edition that illustrate each of these methods, I for one would appreciate having a closer one-to-one correspondence between the programmatic claims outlined in the preface and their amplication in the body of the text.

If, therefore, Dr. Scheffler were to develop his very fruitful ideas on Philosophical Models of Teaching, he might accordingly look for exemplars of his Impression, Insight and Rule Models to illustrate his thesis. There would then be a certain logical unity to his anthology which is not evident in its present organization. Furthermore, if the contributors that are selected are to try to deal with education holistically, then philosophy too should be represented in all of its major subdivisions. In this second edition, there is a leaning to epistemology, there is an anticipation of axiology: but there is not much of what might be considered the ontological domain in either its phenomenal or metaphysical aspects. The denotative entailment of the term 'philosophy' would be better served by such an inclusion.

On the positive side, if we recognize the significant attempt on Dr. White's part to show us that the posing of a question like "Should I be religious? . . . in abstraction from the living experiences of and theological beliefs of Jew or Gentile" is a rather vapid exercise—one aptly characterized in the dictum by Santayana which Dr. White quotes to the effect that "the attempt to speak without speaking any particular language is not more hopeless than the attempt to have a religion that shall be no religion in particular." If we see the wisdom of Dr. Weisberg's effort to demonstrate that an appeal to tradition *qua* tradition still constitutes an appeal to a particularly selected tradition. And if we can appreciate the more theoretical endeavour on Professor Ryle's part to deal with Mind not as an hypostatized abstraction but in mental conduct terms, particularly in the form of those practices of intelligent performance, improvement in which is a product of a successful course of civilized schooling. Then we can see clearly that Dr. Scheffler has given us effective illustrations of his contextual method of analysis, for each of these studies stresses "the dependence of concepts upon the practical

contexts in which they are used.” Tongue in cheek, one might however wonder why the non-contextually delineated term “general philosophy” still crops up in the editor’s Introduction to the Second Edition.

The book’s major strength lies in the first three sections which deftly illustrate the gains in philosophical analysis that have been made in the twentieth century. It is no mean feat to deal with the substance and connotative associations of the term “education” and not lose them in a maze of woolly generalities. If one wanted to produce a theoretical model of the field of education as the universe of discourse of a science of education, then these essays would turn out to be very useful. Dr. Perry’s instructions (*Education and the Science of Education*) to employ the “explanatory, normative and technological methods” of inquiry could serve as a useful starting point. Dr. Black’s endeavour (*Education as Art and Discipline*) to illustrate how other disciplines, in this case, art, can analogically clarify some of the facets of the virtually all-inclusive process of education offers a suggestive approach by which to illumine our understanding. Dr. Price’s attempt (*Discipline in Teaching In Its Study and In Its Theory*) to represent the blanket word “education” in terms of the rules which function within its component disciplines permits us to critically consider what is meant by taking education successively “as teaching activities and as the study of conditions for excellence . . . (and as) a name for the theory of teaching activities.’ Dr. Scheffler’s own contributions (*Is Education a Discipline and Philosophical Models of Teaching*) outline first how one moves from practices to principles in the educational realm while keeping clear the distinctions between references to objects, to phenomena and to words themselves and then illustrate by means of Lockean, Platonic and Kantian type models what would follow for educational theory and practice if each of these systematic aspects in man’s philosophical heritage were to be used as a frame of reference for the examination of the field of education. Dr. Green (*Teaching, Acting and Behaving*) then concerns himself with the psychological and normative dimensions inherent in using rules in the educative process. And Dr. Hirst (*Philosophy and Educational Theory*) caps the discussions in the first half of the book with his attempt to critically evaluate what a number of educational writers have claimed for “educational theory” as measured against the considerations of a more inclusive “philosophy of education.”

Pedagogically, this two level conceptualization advanced by Dr. Hirst can be used by students to organize their thinking about what goes on in both the formal and informal aspects of education. And if the concepts, approaches and delineations offered in the other papers in these sections were taken into consideration, the reader would be able to order the higher level abstractions that appear under the rubric “education” into some kind of coherent and consistent perspective. For having assembled this concentrated focus on the many facets of the field of education student and reader alike are indebted to Dr. Scheffler.

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Dienes has indicated that the problem for mathematics education is in the area of pedagogical technique or teaching methods; he has clearly established that following the curricular reform of the late fifties and early sixties must come instructional reform. In the end, the most important contribution made by the book is the plethora of ideas and suggestions, and for this reason alone the book deserves reading by everyone interested in mathematics education.

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